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Poecilochaetidae (Annelida, Polychaeta) from Japan

By

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Abstract Specimens of the family Poecilochaetidae from Japanese waters are examined. *Poecilochaetus tropicus* OKUDA is newly added to the Japanese fauna and its posterior body is newly described. Eight new species of *Poecilochaetus* are recognized: *P. trilobatus*, *P. tokyoensis*, *P. magnus*, *P. elongatus*, *P. ishikariensis*, *P. clavatus*, *P. granulatus* and *P. bifurcatus*. Setal microstructures are examined by scanning electron microscopy.

The poecilochaetids are poorly known from Japanese waters. *Poecilochaetus japonicus* KITAMORI, 1965, known only from Iyo Nada, was described from anterior fragments, and *P. koshikiensis* MIURA, 1988, was described from off Shimo-Koshiki Island, Kyushu.

Diagnostic characteristics of poecilochaetids include the structure of the nuchal organs, epidermal papillation, and distribution of ampullaceous postsetal lobes. The distribution of setal types is very important, and PILATO and CANTONE (1976) have summarized in tabular form these characteristics of 14 species.

Interpretation of the microstructures of setae in poecilochaetids is extremely difficult based on observation under transmitted-light microscopy. READ (1986) described three species of *Poecilochaetus* occurring in New Zealand waters, and their setal microstructures were examined by scanning electron microscopy (SEM).

In the present study 9 species of *Poecilochaetus* are recognized, including 8 new species and 1 species newly recorded from Japanese waters. The setal microstructures of these species were examined by SEM.

The bulk of the collection, including type specimens, is deposited in the National Science Museum, Tokyo.

The author wishes to express his thanks to Ms. Susan WILLIAMS of Battelle Ocean Sciences, Ventura, California, for critically reading the manuscript.

Family Poecilochaetidae HANNERZ, 1956

Genus *Poecilochaetus* CLAPARÈDE *in* EHLERS, 1875

Prostomium rounded, with two pairs of eyespots. Cephalic organ antero-ventrally inserted. Two long grooved palps. 1–3 tentaculiform nuchal organs. First parapodium directed anteriorly at sides of prostomium, provided with elongated noto- and neuropodial setae that form a cephalic cage. Setigers 2, 3 and sometimes 4 have

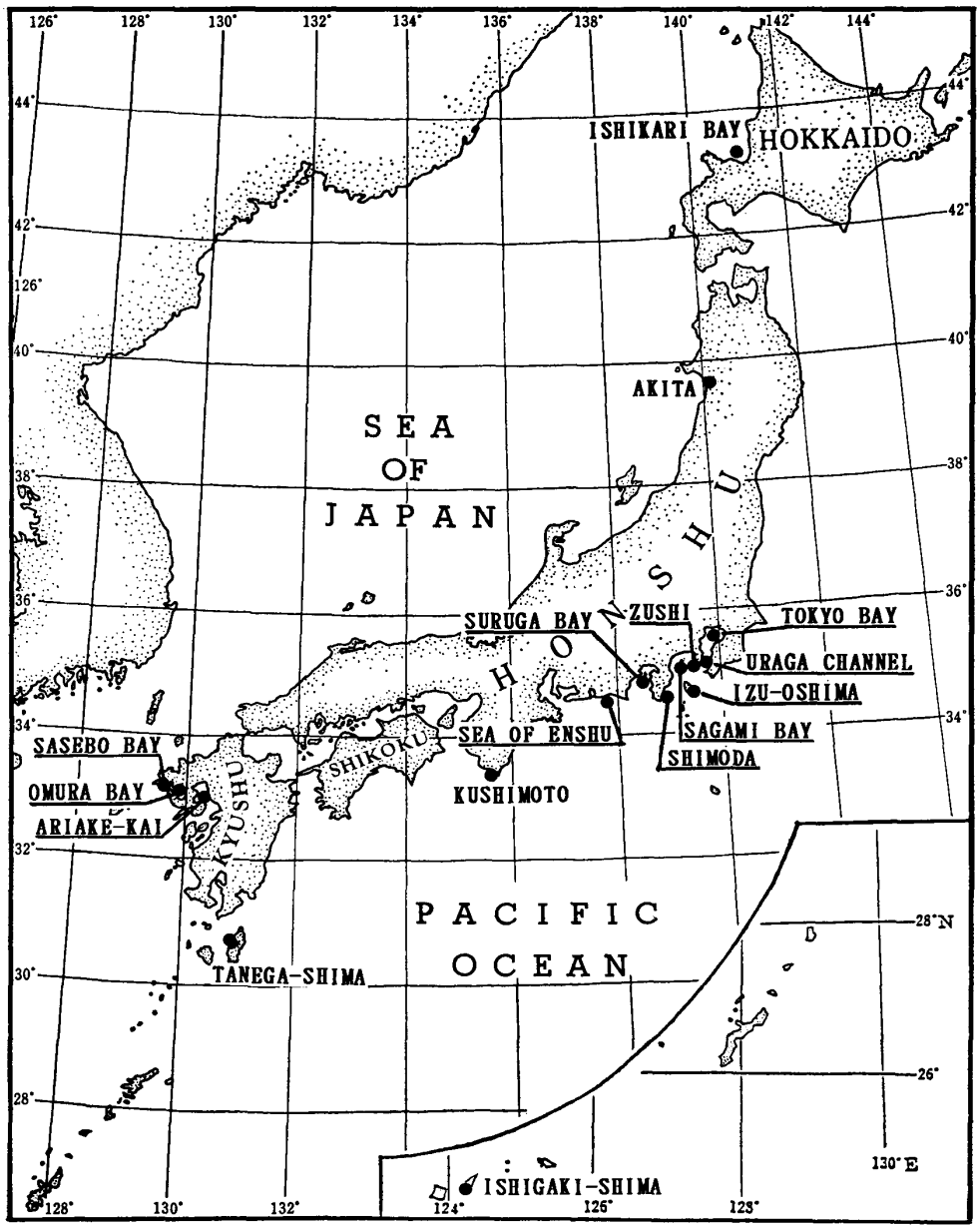


Fig. 1. Map of Japan, showing localities mentioned in the text.

thick spines on neuropodia. Ampullaceous postsetal lobes on a few anterior setigers (seventh to 10–17th). Filiform or bifurcated branchiae behind middle and posterior parapodia, may be absent. Setae include hispid setae, membranous setae, spinal-plumose or hispid-plumose setae, and knobbed setae or aristate setae on posterior parapodia; setal composition changes on parapodia 17–20. Parapodia of about last 20 setigers are modified, with spines on notopodia.

Key to Japanese Species of *Poecilochaetus*

1. Body integument smooth or very lightly papillated 2
1′ Body integument conspicuously papillated 10
2. Ampullaceous postsetal lobes in parapodia 7 through 13..... 3
2′ Ampullaceous postsetal lobes in parapodia 7 through 10 or 12 9
3. Branchiae from at least parapodium 19..... 4
3′ Branchiae absent 6
4. With one greatly elongated nuchal organ 5
4′ With three greatly elongated nuchal organs .....*P. trilobatus* sp. nov.
5. Membranous setae from second parapodium; setal composition change from parapodium 21 .....*P. tropicus* OKUDA.
5′ Membranous setae from fifth parapodium; setal composition change from parapodium 17 .....*P. tokyoensis* sp. nov.
6. With parapodial sensory organs in first 5 setigers 7
6′ Without parapodial sensory organs in first 5 setigers....*P. japonicus* KITAMORI.
7. With knobbed setae on posterior parapodia.....*P. magnus* sp. nov.
7′ Without knobbed setae on posterior parapodia 8
8. Membranous setae from second parapodium; with aristate setae on posterior parapodia.....*P. koshikiensis* MIURA.
8′ Membranous setae from seventh parapodium; without aristate setae on posterior parapodia .....*P. elongatus* sp. nov.
9. Ampullaceous postsetal lobes in parapodia 7 through 12; branchiae absent; with knobbed setae on posterior notopodia .....*P. ishikariensis* sp. nov.
9′ Ampullaceous postsetal lobes in parapodia 7 through 10; branchiae present; with thick simple setae on posterior notopodia .....*P. clavatus* sp. nov.
10. Ampullaceous postsetal lobes in parapodia 7 through 17; postsetal lobes single throughout.....*P. granulatus* sp. nov.
10′ Ampullaceous postsetal lobes in parapodia 7 through 11; some postsetal lobes bilobed.....*P. bifurcatus* sp. nov.

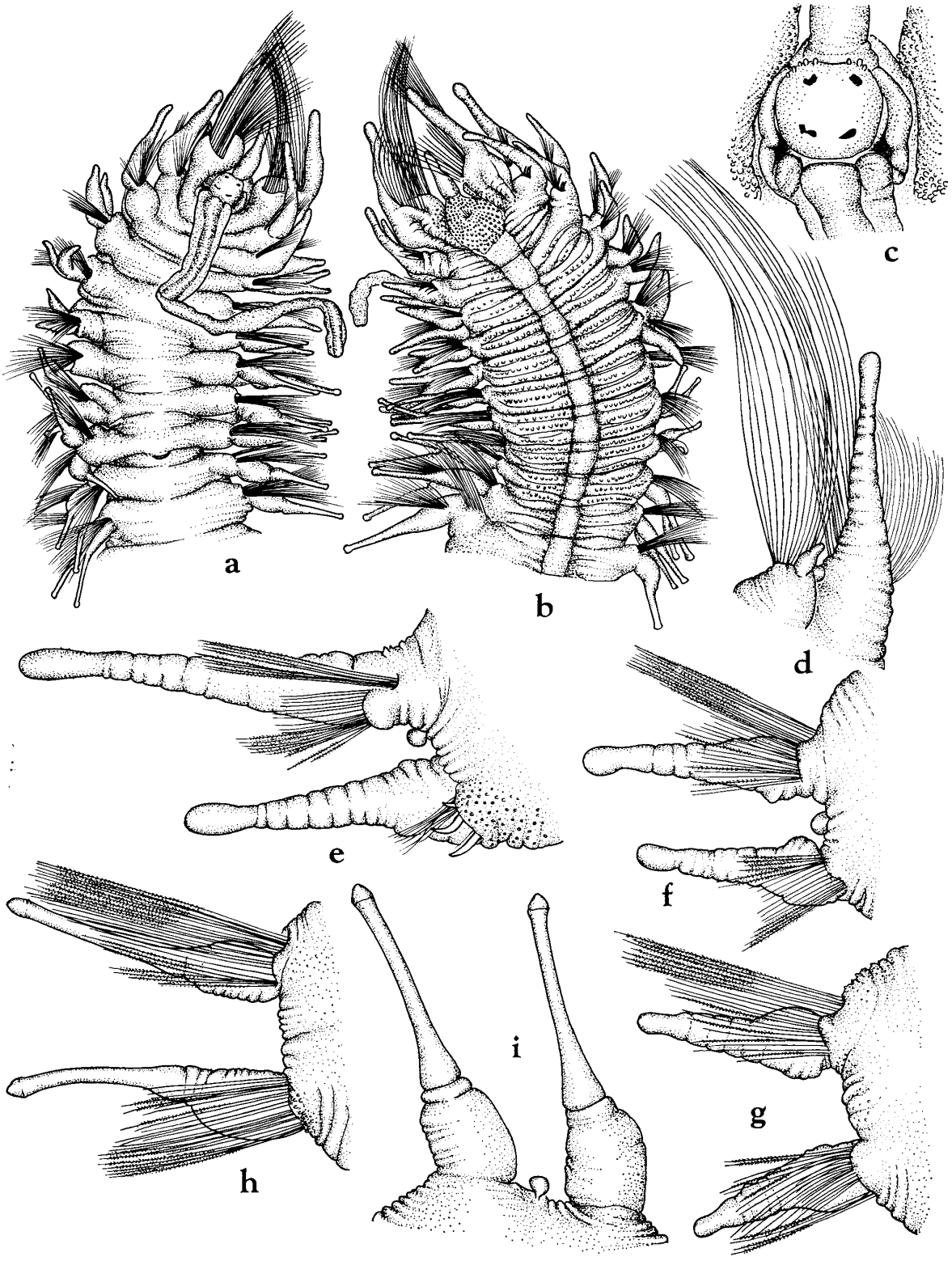
Poecilochaetus tropicus OKUDA, 1935

(Figs. 2 a–q, 3 a–m)

Poecilochaetus tropicus OKUDA, 1935, pp. 289–291, figs. 1–2; 1937, pp. 294–296, figs. 39–40; GIBBS, 1971, p. 176.

Material examined. Miho, Ishigaki-shima, Ryukyu Islands, in sandy beach (2 specimens), VII–1973.

Description. A complete specimen measures 73 mm in length and about 4 mm in width including parapodia; it consists of 104 setigers. The dorsal surface is nearly smooth, and has a chitinous structure on the mid-dorsum of setiger 9 (Fig. 2 a). The ventral sides of the anterior parapodia and the region about the mouth have concentra-



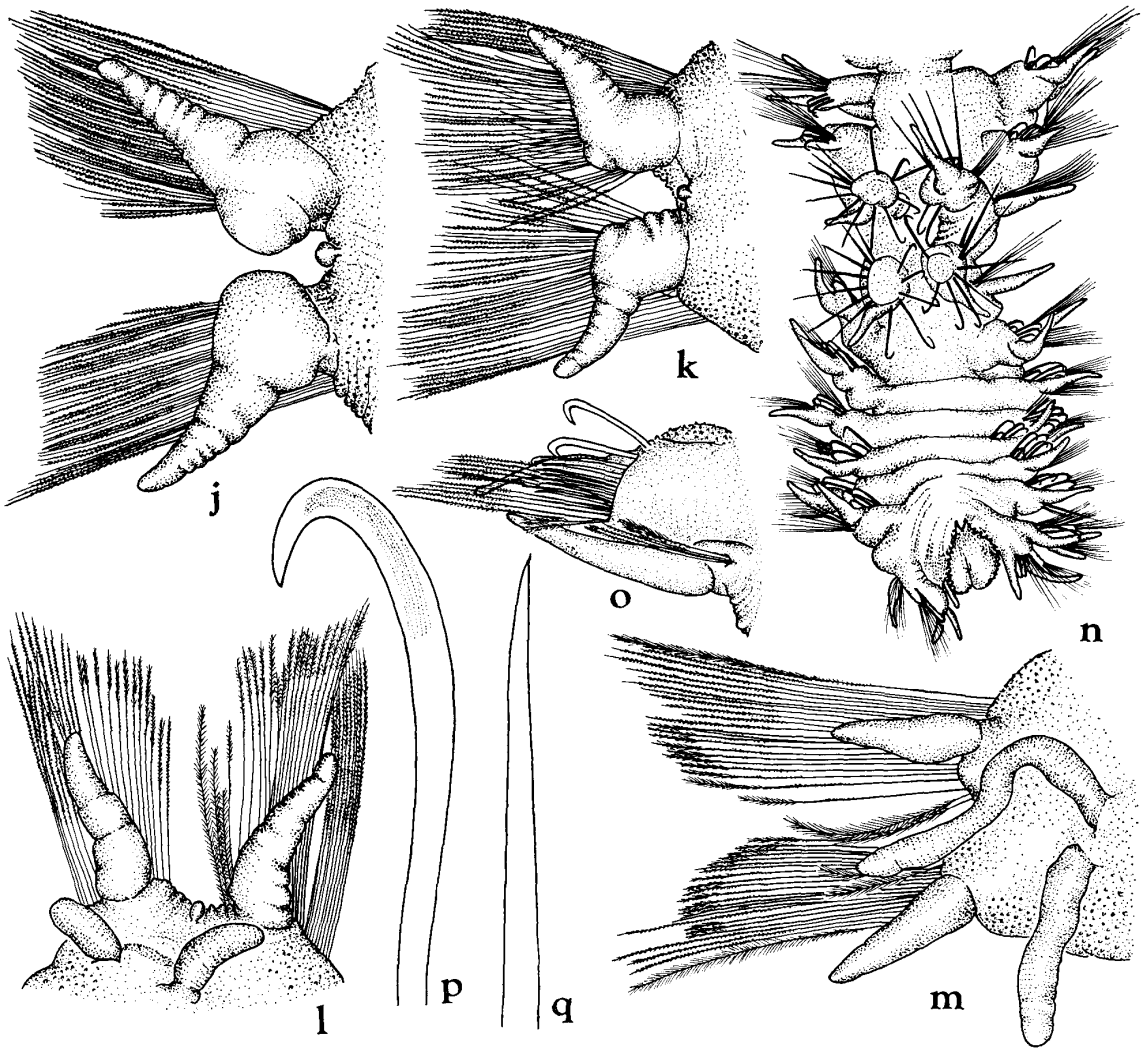
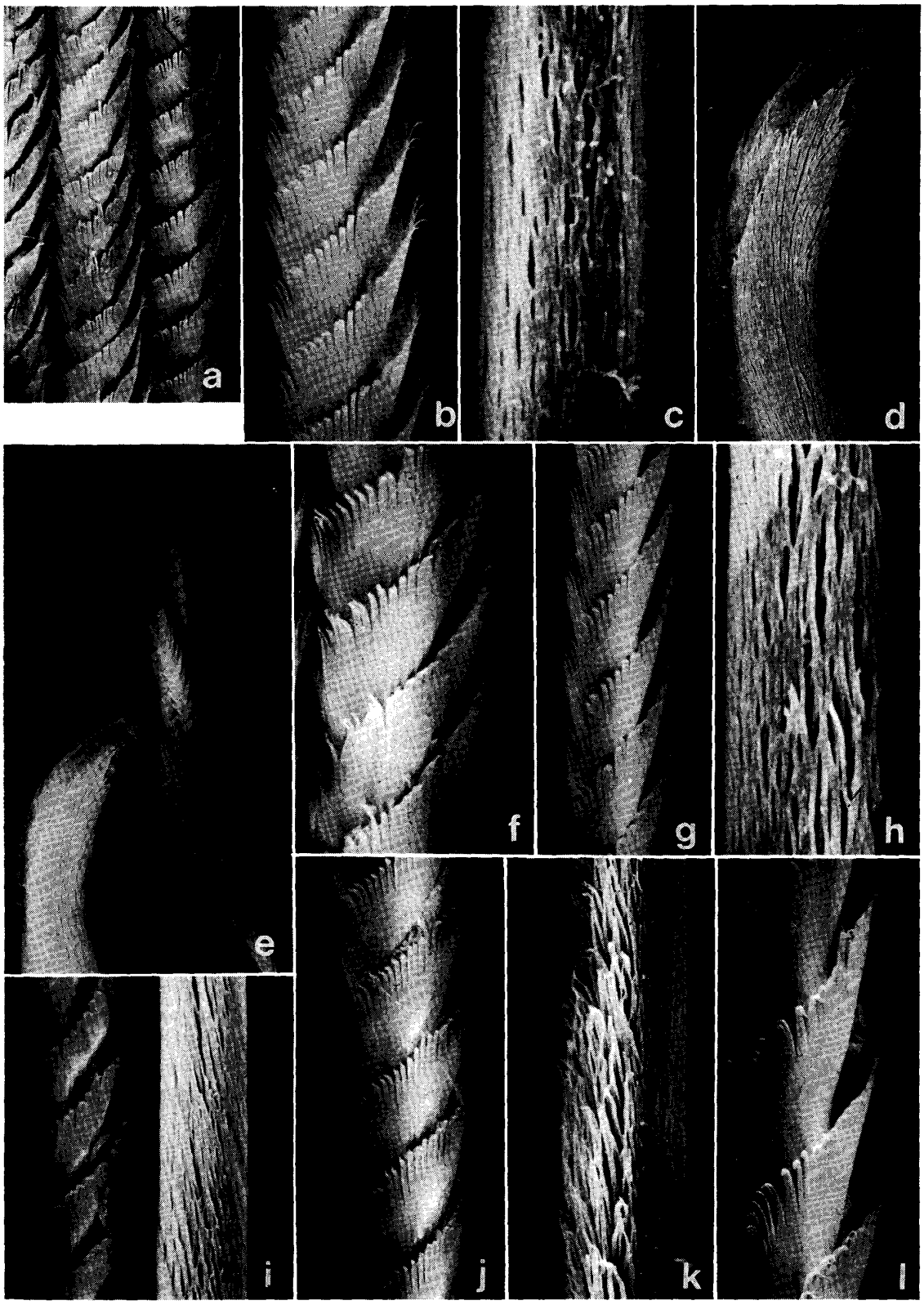


Fig. 2 (on pp. 64–65). *Poecilochaetus tropicus* OKUDA. —— a, b, Anterior ends, dorsal (a) and ventral (b) views, ×9; c, prostomium, dorsal view, ×28; d, first parapodium, posterior view, ×19; e, second parapodium, anterior view, ×27; f, fourth parapodium, anterior view, ×27; g, sixth parapodium, anterior view, ×27; i, 13th parapodium omitted setal fascicle, posterior view, ×27; j, 14th parapodium, posterior view, ×27; k, 20th parapodium, posterior view, ×27; l, 21st parapodium, posterior view, ×27; m, 26th parapodium, posterior view, ×27; n, posterior end, dorsal view, ×12; o, posterior parapodium, anterior view, ×27; p, curved spine from posterior notopodium, ×156; q, straight spine from posterior notopodium, ×156.

tions of papillae. The ventral sides of the first 10 to 12 setigers are triannulated, and each annulation has one row of minute papillae (Fig. 2 b).

The prostomium is subcircular with some papillae around the anterior region. Two pairs of small eyespots present; the anterior pair are elliptical, separated from each other, and are deeply embedded. The posterior pair is irregular in form and



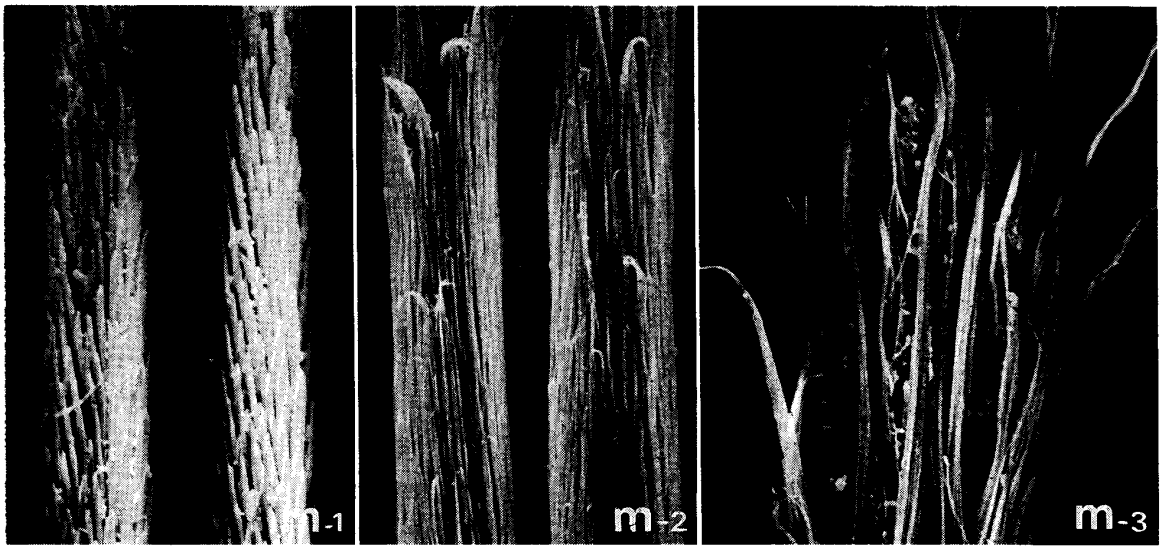


Fig. 3 (on pp. 66–67). *Poecilochaetus tropicus* OKUDA. —— a, b, Membranous setae from second notopodium, a, ×2,100, b, ×3,700; c, hispid seta from second notopodium, ×7,900; d, distal part of thick spine from second neuropodium, ×1,050; e, fascicle of second neuropodium, ×670; f, membranous seta from second neuropodium, ×5,250; g, membranous seta from fourth parapodium, ×3,700; h, hispid seta from fourth parapodium, ×7,900; i, membranous and hispid setae from seventh parapodium, ×3,700; j, membranous seta from 20th parapodium, ×3,700; k, hispid seta from 20th parapodium, ×3,700; l, membranous and hispid setae from 26th parapodium, ×3,700; m, spinal-plumose setae from 26th parapodium, basal (1), medial (2) and distal (3) parts, ×3,700.

less embedded (Fig. 2 c). The median nuchal organ extends posteriorly to setiger 11, and the two lateral nuchal organs are rudimentary small swellings. The mid-ventral cephalic organ is pyriform and longer than the prostomium.

The first parapodium is enlarged, and projects forward; the dorsal postsetal lobe is a short fingerlike projection, and the ventral postsetal lobe is long and tapering. Notosetae are long, inwardly curved, and form the cephalic cage. Neurosetae are similar, but shorter than the notosetae. They are all capillaries (Fig. 2 d).

The second parapodium has long, tapering dorsal and ventral postsetal lobes; the ventral lobe is about two-thirds as long as the dorsal one (Fig. 2 e). The fascicle of notosetae is composed of closely coiling membranous setae (Fig. 3 a, b) and hispid setae (Fig. 3 c). Neurosetae include three thick spines with hirsute tips (Fig. 3 d) in a transverse series, and a small fascicle of short membranous setae (Fig. 3 e, f); there are no smooth capillaries or hispid setae. The third parapodium is similar to the second.

The fourth (Fig. 2 f) and sixth (Fig. 2 g) parapodia are similar to each other, but the fifth parapodium has a longer dorsal postsetal lobe than the others. Those parapodia have fascicles of membranous setae (Fig. 3 g) and hispid setae (Fig. 3 h).

Parapodia 7 to 13 have ampullaceous postsetal lobes; the base is thickened and the neck is slender, terminating in a bulbous tip (Fig. 2 h, i). Those parapodia have membranous and hispid setae (Fig. 3 i) in both noto- and neuropodia.

In the following parapodia through setiger 20 the dorsal and ventral postsetal lobes are swollen in the proximal portions of their bases (Fig. 2 j, k); each has fascicle of membranous (Fig. 3 j) and hispid (Fig. 3 k) setae. From the 21st parapodium swollen postsetal lobes are replaced by digitate lobes, and branchiae arise from the posterior side, as bifid club-shaped lobes separate from each other (Fig. 2 l).

The setal composition changes on the 21st parapodium, with hispid and membranous setae (Fig. 3 l), plumose setae and spinal-plumose setae (Fig. 3 m) in each ramus. In the more posterior parapodia the branchiae become elongated lobes, about two times as long as the postsetal lobes (Fig. 2 m); the spinal-plumose setae increase in number.

Parapodial sensory organs are present from setiger 1 through 5, and from setiger 10 through posterior; the organs gradually diminish in size and remain as a small depression.

The parapodia and setae of last 20 parapodia are modified; notopodia of the 12th and 13th setigers from the posterior end are directed dorsally (Fig. 2 n). Each of modified parapodia has slender, dorsal and ventral postsetal lobes (Fig. 2 o); the setal fascicles consist of 4 blunt and curved spines (Fig. 2 p), 9 thick straight spines with pointed tips (Fig. 2 q), membranous setae and spinal-plumose setae in the notopodium, and membranous setae and spinal-plumose setae in the neuropodium. There are no aristate setae or branchiae.

The anus opens almost terminally, surrounded by 26 small, rounded papillae; there is one papilla in the dorsal midline.

Remarks. This species was described based on an anterior fragment consisting of 39 setigers. The collection of a complete specimen has allowed the first description of the posterior body of *P. tropicus*.

This species is distinctly separable from related species in having a small fascicle of membranous setae on the second and third neuropodia, instead of short capillaries or hispid setae. Moreover, the species is unique in that the noto- and neuropodial postsetal lobes change in form after setiger 21.

The species is new to the Japanese fauna.

Distribution. Palau Islands; Solomon Islands; Ishigaki-shima, southern Japan.

Poecilochaetus trilobatus sp. nov.

(Figs. 4 a–s, 5 a–n)

Material examined. Tokyo Bay: 35°13.5′N, 139°50.0′E, in 10 m (1), XII–1978; 35°20.0′N, 139°46.0′E, in 14 m (6), VIII–1982; 35°22.0′N, 139°44.0′E, in 20 m (4), III–1983. Sagami Bay: 35°16.4′N, 139°27.0′E, in 57 m (1); 35°07.4′N, 139°34.0′E, in 98 m (1); 35°17.4′N, 139°32.4′E, in 6 m (1); 35°17.1′N, 139°32.0′E, in 15 m (3), VII–1979. Off Akita: 39°47.0′N, 140°02.0′E, in 5 m (1); 39°47.0′N, 140°00.8′E, in 20 m (1), VIII–1982. Sasebo Bay, in 23 m (2), V–1972. Kabira Bay, Ishigaki-shima, Ryukyu Islands, sandy beach (holotype and 4 paratypes and 2 autotomized posterior

ends), VI–1973.

Description. The holotype measures 21 mm in length and about 3.5 mm in width including parapodia; it consists of 42 setigers. The dorsal surface is nearly smooth, but the ventral sides of anterior segments are each triannulated; the median annulation is provided with one row of fleshy papillae (Fig. 4 a).

The prostomium is subspherical, and has two pairs of minute eyespots. The posterior pair are close together, near the prostomial margin; and the anterior pair are more separated from each other (Fig. 4 b). The midventral cephalic organ is palpiform and biarticulated, as long as the prostomium. The nuchal organs are well developed, consisting of three elongate processes; the median one reaches posteriorly to setiger (6 to) 9 and the two lateral ones reach to setiger (5 to) 7 (Fig. 4 c). A mid-dorsal chitinized structure is present on the posterior part of setiger 9.

The first parapodia are enlarged and project forward, almost surrounding the prostomium. The dorsal postsetal lobe is a short, fingerlike projection; the ventral postsetal lobe is large and clavate, similar in shape and size to the dorsal postsetal lobes of the second parapodium (Fig. 4 d). Setal fascicles of the first parapodium are directed anteriorly.

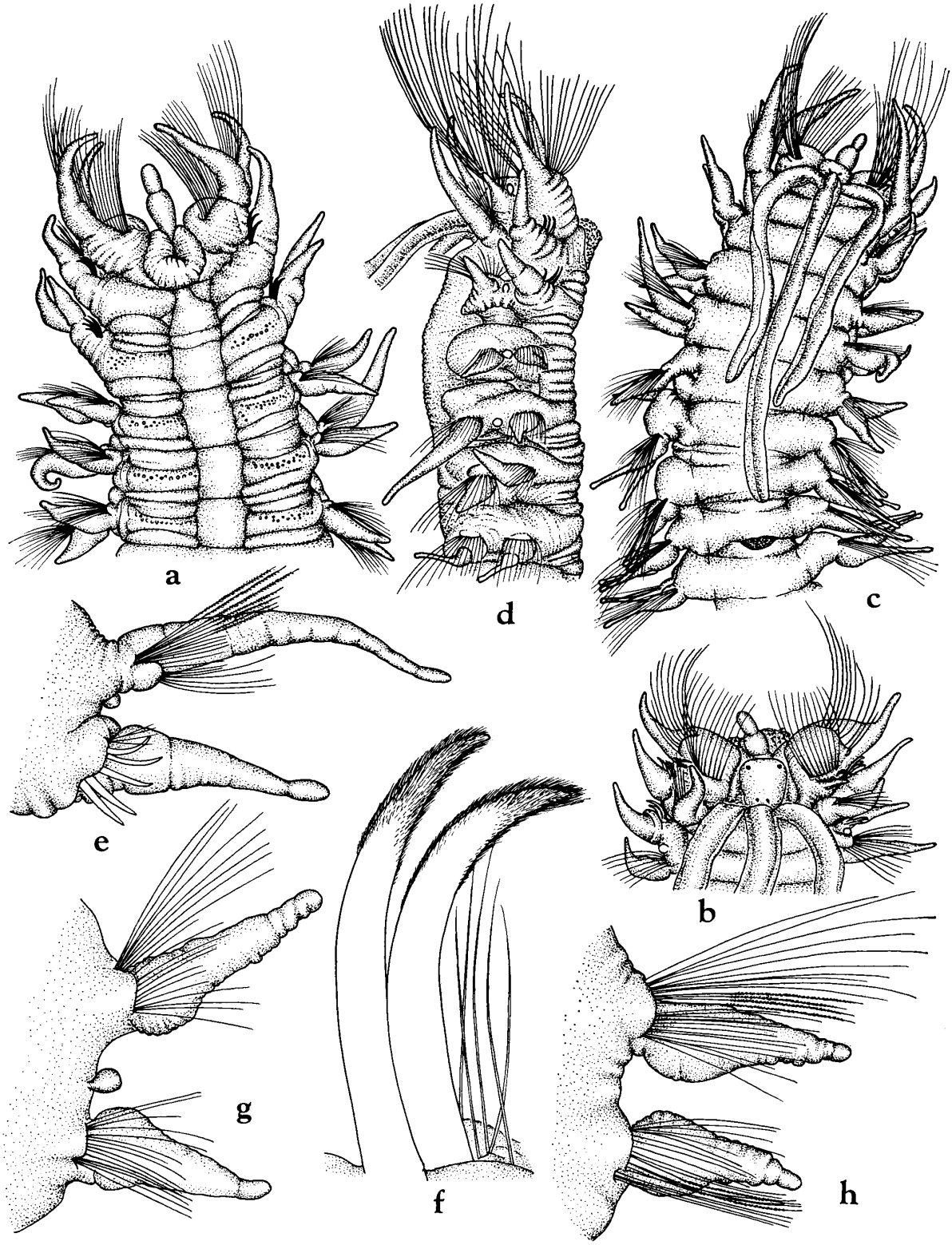
The second parapodia have long, tapering dorsal and ventral postsetal lobes (Fig. 4 e). The notopodial fascicle consists of superior membranous setae (Fig. 5 a) and inferior hispid setae (Fig. 5 b). The neuropodial setae consist of five curved, thick spines with hirsute tips (Fig. 5 c), accompanied by a few fine hispid setae (Fig. 4 f).

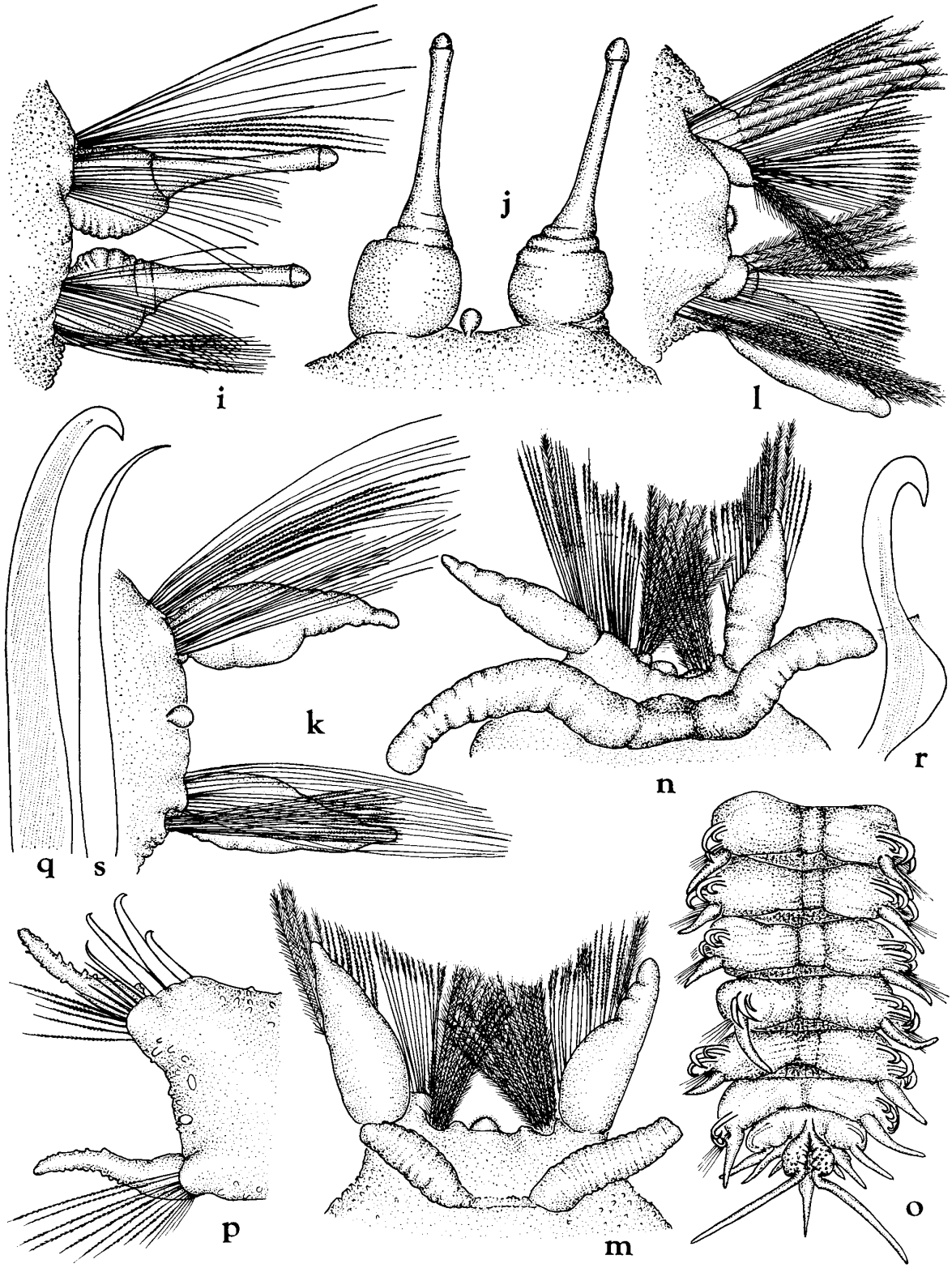
The third parapodia have noto- and neuropodial setae resembling those of the second parapodia. The fourth (Fig. 4 g) and sixth (Fig. 4 h) parapodia are similar to each other, but the fifth parapodia have long, dorsal postsetal lobes. The fourth parapodia have only short or long hispid setae (Fig. 5 d); from the fifth parapodia membranous setae appear in the fascicles of both rami.

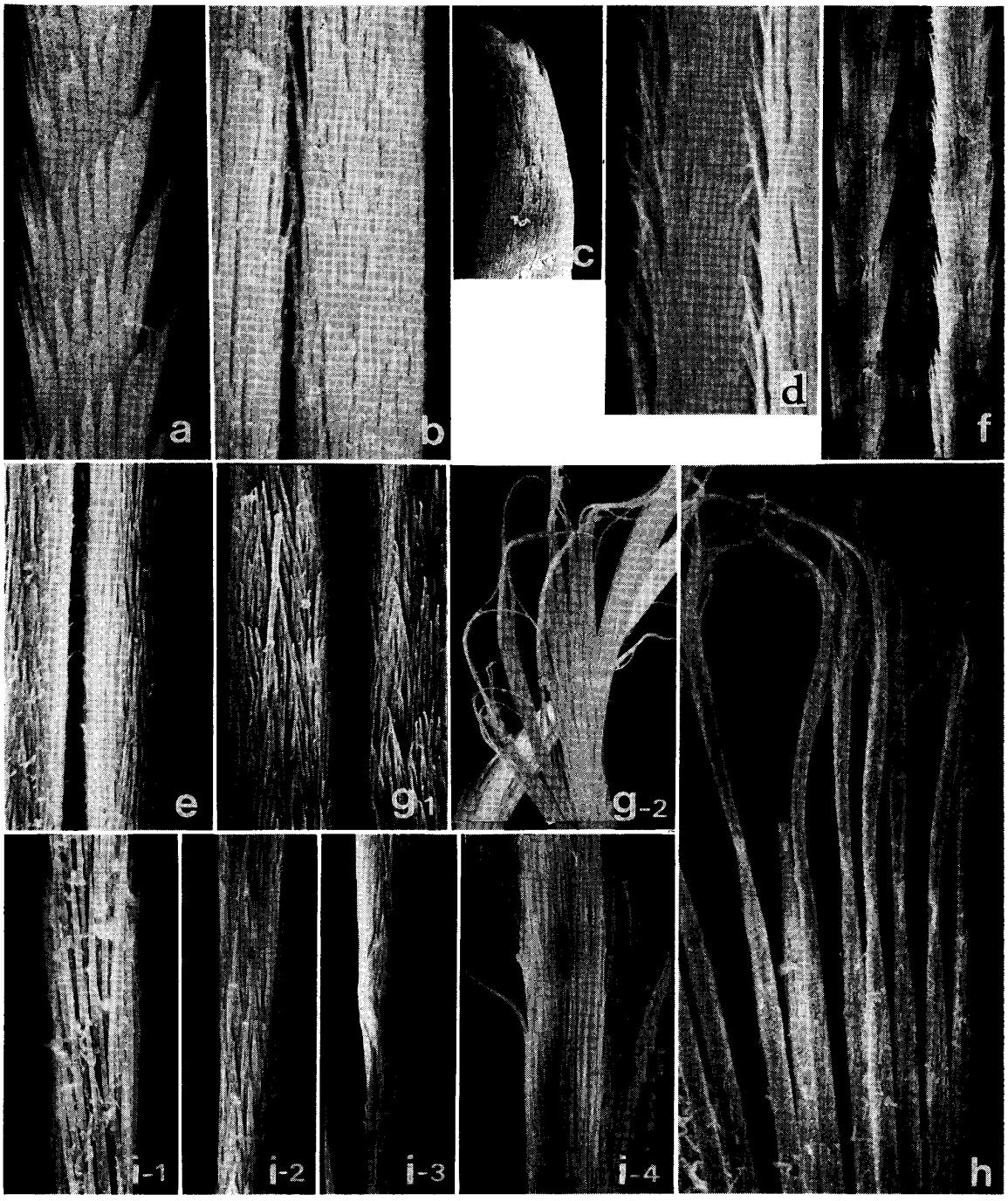
Parapodia 7 to 13 have ampullaceous postsetal lobes; their bases are thickened, and the necks are slender and tapered, terminating in bulbous tips (Fig. 4 i, j). The setal fascicles consist of short or long hispid setae (Fig. 5 e) and membranous setae (Fig. 5 f).

From the 14th parapodia (Fig. 4 k) dorsal and ventral postsetal lobes resemble those anterior to parapodium 7; the setal fascicles consist of hispid setae and membranous setae. The setal composition changes on the 17th parapodium (Fig. 4 l);

Fig. 4 (on pp. 70–71). *Poecilochaetus trilobatus* sp. nov. —— a, Anterior end, ventral view, ×16; b, prostomium of paratype, dorsal view, ×19; c, anterior end, dorsal view, ×14; d, anterior end of paratype, lateral view, ×20; e, second parapodium, anterior view, ×34; f, setae from second neuropodium, ×305; g, fourth parapodium, anterior view, ×40; h, sixth parapodium, anterior view, ×40; i, seventh parapodium, anterior view, ×40; j, 13th parapodium ommited setae, posterior view, ×40; k, 14th parapodium, anterior view, ×40; l, 17th parapodium, anterior view, ×40; m, 23rd parapodium, posterior view, ×40; n, 30th parapodium, posterior view, ×40; o, posterior end, dorsal view, ×33; p, posterior parapodium, anterior view, ×76; q, r, thick curved spines from posterior notopodium, ×156; s, slender spine from posterior notopodium, ×156.







plumose setae, membranous setae and hispid-plumose setae (Fig. 5 g) occur in both rami.

The 23rd parapodium (Fig. 4 m) has setal fascicles consisting of plumose setae, membranous setae and spinal-plumose setae (Fig. 5 h, i) with a knob (Fig. 5 j) located at the subdistal narrowed part. The inferior part of the knob is formed by a narrow hispid ridge. In the 30th parapodium (Fig. 4 n) the knobs of the spinal-plumose

Fig. 5 (on pp. 72–73). *Poecilochaetus trilobatus* sp. nov. —— a, Membranous seta from second notopodium, ×5,400; b, hispid seta from second notopodium, ×8,100; c, distal end of thick spines from second neuropodium, ×2,200; d, hispid setae from fourth parapodium, ×8,100; e, hispid setae from seventh parapodium, ×5,400; f, membranous setae from seventh parapodium, ×2,200; g, hispid-plumose seta from 17th parapodium, medial (1) and distal (2) parts, ×3,900; h, fascicle of spinal-plumose setae from 23rd parapodium, ×540; i, spinal-plumose seta from 23rd parapodium, medial (1) through distal (4) parts, ×3,000; j, knob of spinal-plumose seta, ×6,400; k, l, knobs with following ridge of spinal-plumose setae, ×3,000; m, fascicle of aristate setae from posterior parapodium, ×850; n, aristate seta, medial (1) through distal (3) parts, ×3,000.

setae are swollen structures with a trailing ridge (Fig. 5 k, l). In more posterior parapodia the spinal-plumose setae transform into aristate setae with a hirsute tip and a plumose-like prolongation (Fig. 5 m, n).

Parapodial sensory organs are present from setiger 1 through 5, and from setiger 10 through posterior. Branchiae are present from the 18th parapodium as a single lobe, increasing to two lobes on the 19th parapodium; those extend beyond the postsetal lobes. They are missing on the last 30 parapodia.

The last 18 setigers are modified in parapodial structure and setal types (Fig. 4 o). The noto- and neuropodial postsetal lobes are digitate with scattered, rather large

tubercles (Fig. 4 p). The notopodium has 3 thick, distally curved spines (Fig. 4 q, r), 5–7 slender spines (Fig. 4 s) and a fascicle of membranous setae. The neuropodium has a fascicle of hispid setae and membranous setae.

The pygidium has a median and two lateral slender cirri.

Remarks. *Poecilochaetus trilobatus* resembles *P. serpens* ALLEN, 1904, from Plymouth, England, *P. paratropicus* GALLARDO, 1967, from Nha Trang, South Viet Nam, *P. serpens honiarae* GIBBS, 1971, from Solomon Islands, and *P. exmouthensis* HARTMANN-SCHRÖDER, 1980, from Exmouth Gulf, Australia in that all four species have three long nuchal organs. However, *P. trilobatus* is distinguishable from *P. serpens* and *P. s. honiarae* in the feature of the aristate seta. *P. paratropicus* is missing branchiae and the notopodial setae in parapodia 7–13 are only simple, smooth setae. *P. exmouthensis* has no characteristic aristate setae like those of *P. trilobatus.*

Type series. Holotype, NSMT–Pol. H 258; 4 paratypes, NSMT–Pol. P 259.

Distribution. Central to southern Japan.

Poecilochaetus tokyoensis sp. nov.

(Figs. 6 a–j, 7 a–h)

Material examined. Tokyo Bay: 35°21.0′N, 139°40.0′E, in 13 m, VIII–1981 (holotype and 1 paratype).

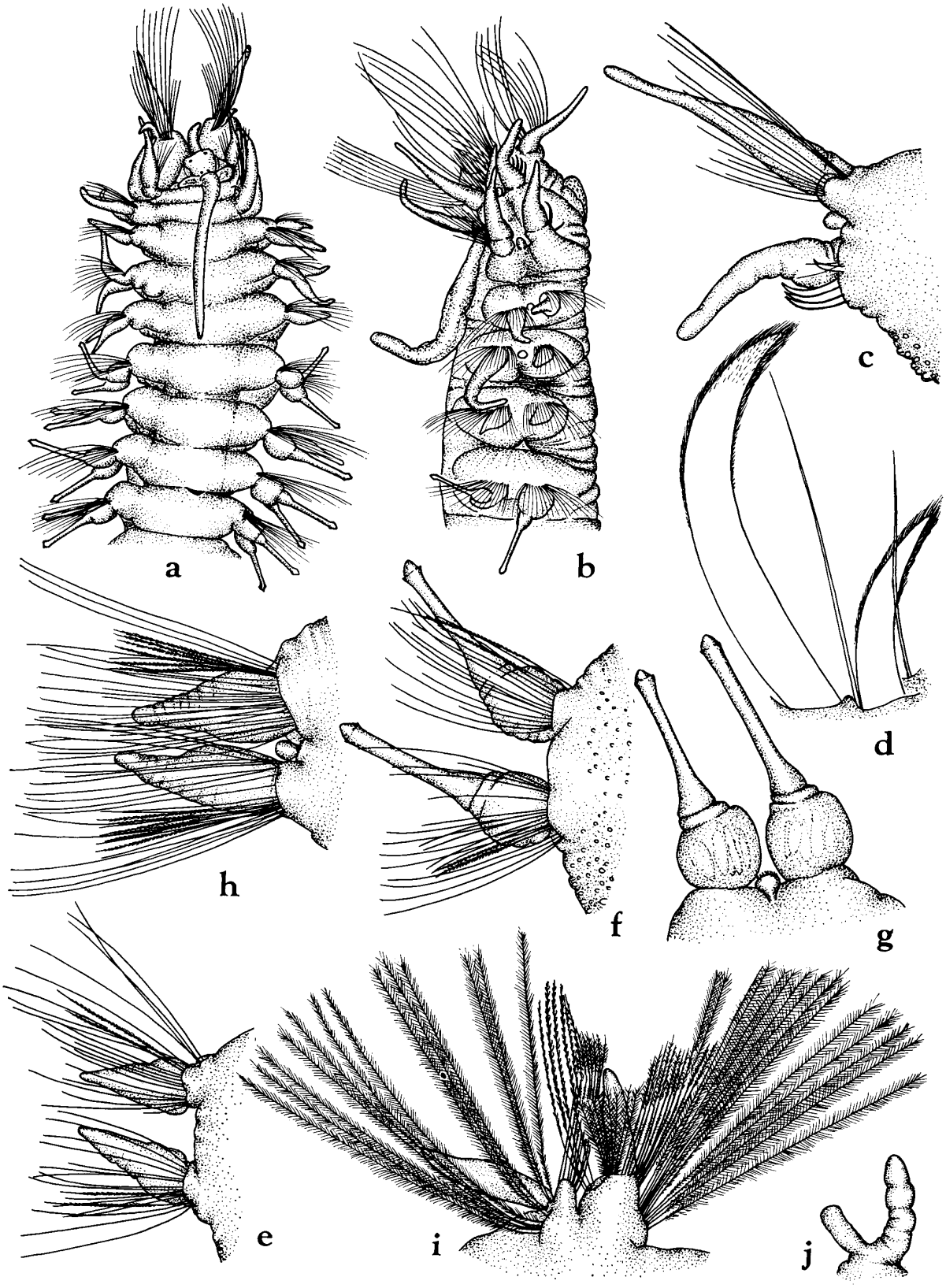
Description. All specimens are incomplete and consist of anterior body fragments. The holotype measures 11 mm in length and about 1.6 mm in width including parapodia; it consists of 31 setigers.

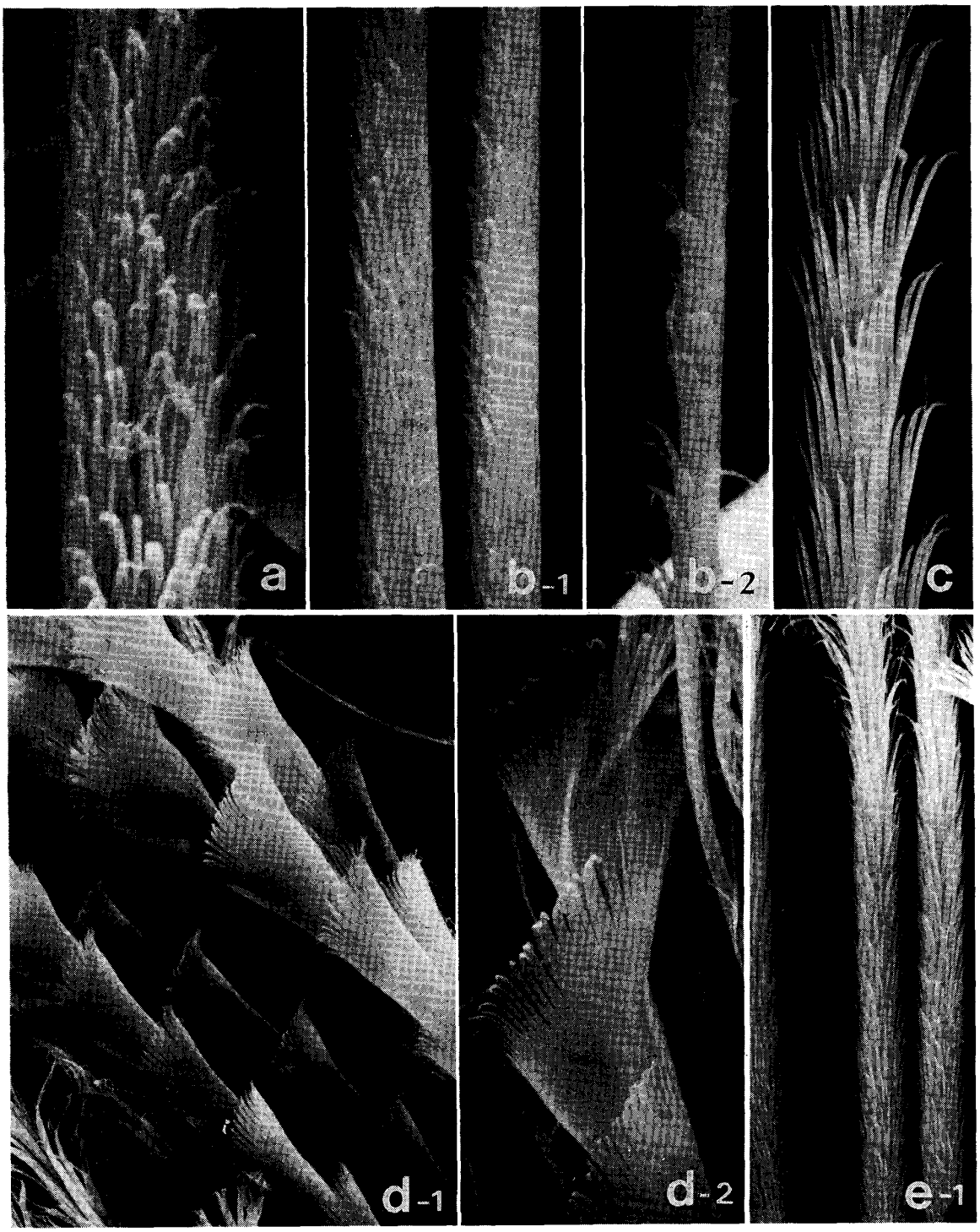
The prostomium is subquadrate; there are two minute posterior eyespots situated close together and two eyes near the anterior margin, widely separated from each other. The median nuchal organ reaches to setiger 6; the two lateral ones are less conspicuous swellings. The midventral cephalic organ is longer than the prostomium. A chitinous elevated structure is present on the mid-dorsum of setiger 9 (Fig. 6 a).

The first parapodia are largest and directed obliquely forward; the dorsal postsetal lobe is small and digitate, but the ventral one is slender and tapering. Setae are smooth capillaries and curved medially (Fig. 6 b).

The second parapodia have long, tapering dorsal and ventral postsetal lobes (Fig. 6 c). The notopodial setae are hispid, but appear like smooth capillaries under low magnification. The neurosetae consist of four curved, thick spines with hirsute tips, accompanied by very slender capillaries (Fig. 6 d). The setae of the third parapodia are like those of the second. The fourth and sixth parapodia are similar to each other, but the fifth parapodium has a long dorsal postsetal lobe. Membranous setae

Fig. 6. *Poecilochaetus tokyoensis* sp. nov. —— a, Anterior end, dorsal view, ×20; b, the same, lateral view, ×26; c, second parapodium, anterior view, ×54; d, setae of second neuropodium, ×330; e, sixth parapodium, anterior view, ×54; f, seventh parapodium, anterior view, ×54; g, 13th parapodium, posterior view, ×54; h, 14th parapodium, anterior view, ×54; i, 28th parapodium, anterior view, ×54; j, branchia from 24th parapodium, ×54.





arise from the fifth parapodium. The sixth parapodium (Fig. 6 e) has short and thick hispid setae (Fig. 7 a), slender hispid setae (Fig. 7 b), and 2 membranous setae (Fig. 7 c) in each podium.

Parapodia 7 to 13 have ampullaceous postsetal lobes; the base is thickened, and

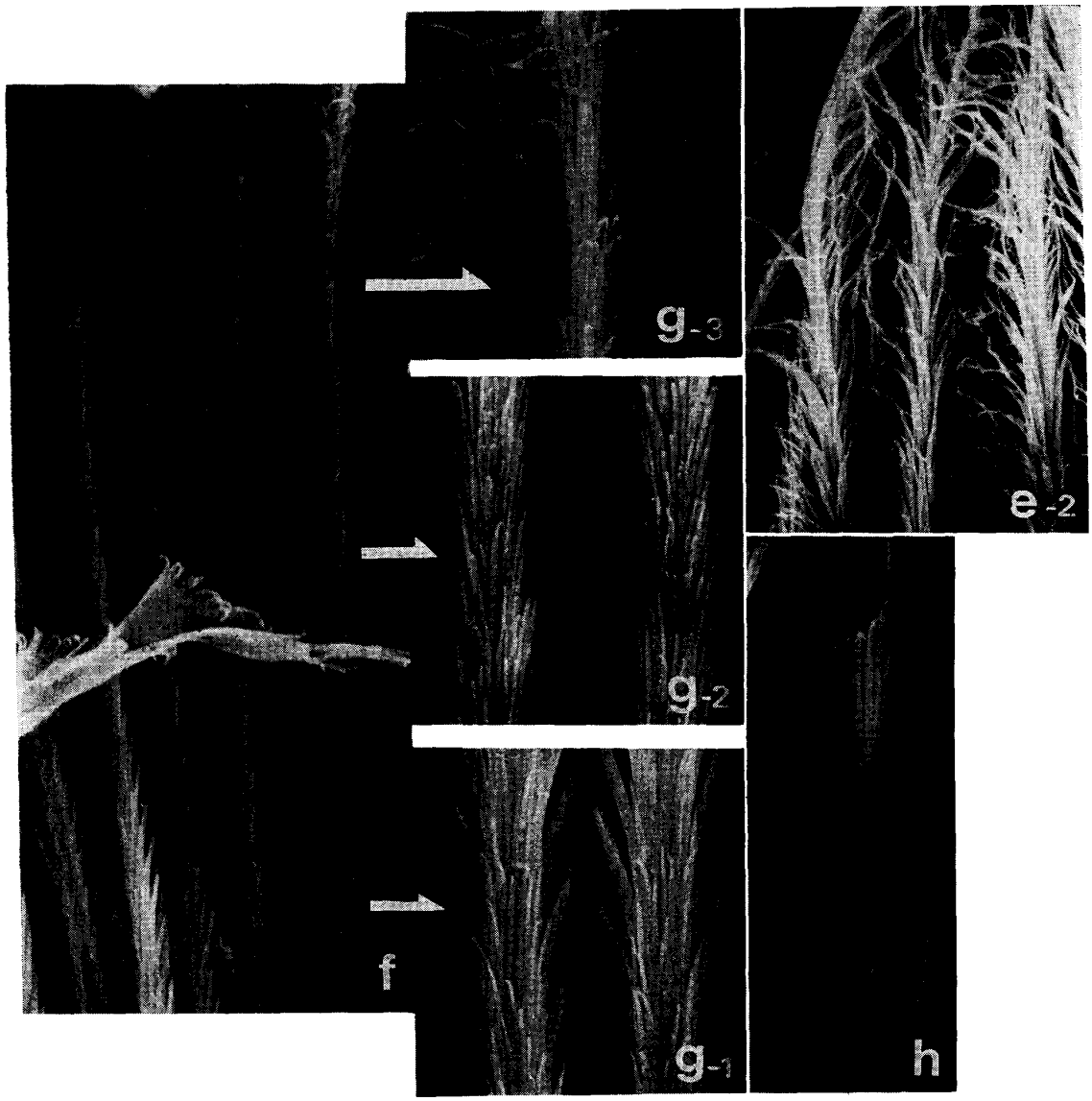


Fig. 7 (on pp. 76–77). *Peocilochaetus tokyoensis* sp. nov. —— a, Thick hispid seta from sixth parapodium, ×10,200; b, slender hispid setae from same parapodium, medial (1, ×6,800) and distal (2, ×10,200) parts; c, membranous seta from same parapodium, ×6,800; d, membranous setae from 17th parapodium, fascicle (1, ×2,700) and distal part (2, ×10,200); e, hispid-plumose setae from 17th parapodium, basal (1, ×2,700) and distal (2, ×2,500) parts; f, fascicle of spinal-plumose setae from 28th parapodium, ×1,800; g, spinal-plumose setae, basal (1), medial (2) and distal (3) parts, ×4,300; h, membranous seta from 28th parapodium, ×5,300.

the neck is slender and tapered, terminating in a bulbous tip (Fig. 6 f, g). The setal fascicles consist of hispid setae and membranous setae.

The 14th parapodium (Fig. 6 h) has spindle-shaped noto- and neuropodial postsetal lobes; it has short and long hispid setae and a small number of membranous

setae. The setal composition changes on the 17th parapodium; it consists of plumose setae, membranous setae (Fig. 7 d) and hispid-plumose setae (Fig. 7 e) in both rami. The hispid-plumose setae are replaced by spinal-plumose setae from the 23rd parapodium.

The 28th parapodium (Fig. 6 i) has fan-shaped setal fascicles consisting of three kinds of setae in both rami: plumose setae, spinal-plumose setae (Fig. 7 f, g) and membranous setae (Fig. 7 h). Aristate setae could not be ascertained in the posterior body region.

Parapodial sensory organs are present from setiger 1 through 5, and from setiger 10 through the posterior. Branchiae arise from the 19th parapodium as one lobe, and are bilobed from the next parapodium (Fig. 6 j); they are well developed in the posterior parapodia.

Remarks. *Poecilochaetus tokyoensis* is closely allied to *P. elongatus* (described below) in many characteristics. However, *P. tokyoensis* has bilobed branchiae, whereas *P. elongatus* lacks branchiae.

Type series. Holotype, NSMT–Pol. H 260; 1 paratype, NSMT–Pol. P 261.

Distribution. Central Japan.

Poecilochaetus elongatus sp. nov.

(Figs. 8 a–f, 9 a–e, 10 a–l)

Material examined. Uraga Channel: 35°10.1′N, 139°48.5′E, in 270 m (4), IX–1978. Tokyo Bay: 35°13.5′N, 139°48.2′E, in 20 m (1), XII–1978. Sagami Bay: 35°09.4′N, 139°34.0′E, in 101 m (2), 35°16.4′N, 139°27.0′E, in 57 m (1), 35°09.4′N, 139°37.0′E, in 11 m (holotype and 1 paratype), 35°16.4′N, 139°30.0′E, in 28 m (1), 35°17.4′N, 139°23.0′E, in 60 m (1), VII–1979; 35°15.5′N, 139°25.0′E, in 116 m (1), 35°17.8′N, 139°22.0′E, in 40 m (2), 35°17.7′N, 139°24.0′E, in 47 m (1), VI–1982. Off Zushi: 35°16.1′N, 139°33.0′E, in 35 m (1), VII–1967. Off Shimoda: 34°39.7′N, 138°57.0′E–34°39.6′N, 138°56.9′E, in 17–28 m (1), X–1981. Off Kushimoto: 33°28.9′N, 135°49.1′E, in 35 m (4), VII–1978. Sea of Enshu: 35°35.6′N, 138°01.9′E, in 80 m (2), V–1967. Sasebo Bay: 33°05.8′N, 128°44.6′E, in 8 m (1), V–1972; 33°03.3′N, 128°44.1′E, in 5 m (1), XI–1972. Omura Bay: 32°54.0′N, 128°56.0′E, in 10 m (1), VIII–1972.

Description. All specimens are incomplete and consist of anterior body fragments. The holotype measures 31 mm in length and about 2.5 mm in width including parapodia; it consists of 50 setigers.

The prostomium is subquadrate, with a smooth anterior margin. Two pairs of minute eyespots are present; those of the posterior pair are close together, near the posterior margin, and those of the anterior pair are more separated from each other. The midventral cephalic organ is as long as the prostomium. A well-developed nuchal organ arises at the posterior margin of the prostomium and extends posteriorly to setiger 5; the lateral lobes are discoid. A mid-dorsal chitinized structure is pre-

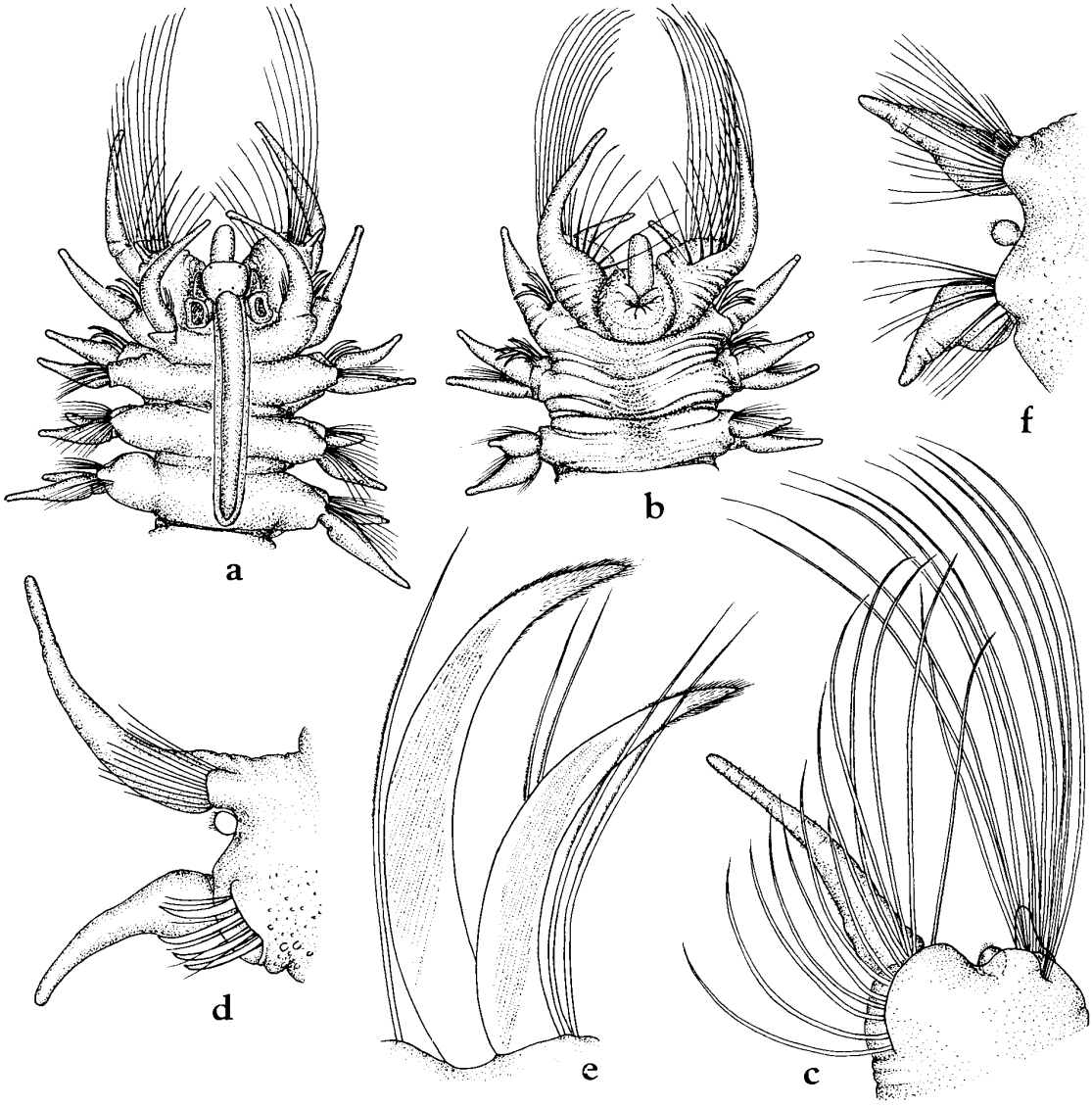


Fig. 8. *Poecilochaetus elongatus* sp. nov. —— a, b, Anterior ends, dorsal (a) and ventral (b) views, ×22; c, first parapodium, anterior view, ×46; d, second parapodium, anterior view, ×46; e, thick spines and limbate capillaries from second neuropodium, ×282; f, fourth parapodium, anterior view, ×46.

sent on the posterior margin of setiger 9 (Fig. 8 a, b).

The first parapodium is enlarged and projects forward. The dorsal postsetal lobe is a slender, fingerlike projection; the ventral postsetal lobe is large, clavate, similar in shape and size to that of the second parapodium (Fig. 8 c). It is covered by minute dispersed papillae with some short cirri (Fig. 10 a, b). Setal fascicles of the first parapodium are directed anteriorly; those form a cephalic cage. Noto- and neurosetae appear smooth under low magnification, but they are closely denticulated (Fig. 10 c).

In the second parapodium (Fig. 8 d) notopodial setae are all hispid setae, but

these appear to be smooth capillaries under low magnification. There are no membranous setae. The neuropodial setae consist of four curved, thick spines with hirsute tips, accompanied by a few fine limbate capillaries (Fig. 8 e).

The third parapodium has noto- and neurosetae resembling those of the second parapodium. The dorsal postsetal lobes of the fifth parapodia (Fig. 9 a) are longer than those of the fourth (Fig. 8 f) and sixth (Fig. 9 b) parapodia. These parapodia have only thick (Fig. 10 d) and slender (Fig. 10 e) hispid setae.

Parapodia 7 to 13 have ampullaceous postsetal lobes; the bases are thickened, and the neck is slender and tapered, terminating in a bulbous tip (Fig. 9 c). These parapodia have setal fascicles of slender hispid setae, thick hispid setae and membranous setae (Fig. 10 f) in both rami.

The 14th parapodium has broad foliose noto- and neuropodial postsetal lobes (Fig. 9 d) and conspicuous hispid setae (Fig. 10 g) and membranous setae (Fig. 10 h). Plumose setae and hispid-plumose setae (Fig. 10 i, j) are first present from the 17th parapodium. Four kinds of setae are arranged as follows from the distal portion to the proximal portion of the fascicle: plumose setae, membranous setae, hispid-plumose setae and plumose setae in both podia. The hispid-plumose setae are replaced by spinal-plumose setae (Fig. 10 k) from about the 20th parapodium.

The 26th parapodium has a fan-shaped, setal fascicle consisting of three kinds of setae: plumose setae, membranous setae, spinal-plumose setae and plumose setae arranged from distal portion to the proximal portion of the fascicles in both podia (Fig. 9 e). Spinal-plumose setae of the more posterior parapodia differ from those of the anterior parapodia in the development of the spines along the setal axis and the terminal hairs (Fig. 10 l). There are no aristate setae in the posterior parapodia.

Parapodial sensory organs are present from setiger 1 through 5, and from setiger 10 through the posterior. No branchiae are seen.

Remarks. *Poecilochaetus elongatus* is allied to *P. johnsoni* HARTMAN, 1939 (redescribed by PILATO and CANTONE, 1976), from Mission Bay, southern California, as follows: (1) setigers 7–13 have ampullaceous postsetal lobes, (2) the median nuchal organ extends to setiger 5, (3) branchiae are absent and (4) the parapodial sensory organs present on setigers 1–5, 10 through posterior. However, *P. johnsoni* has aristate setae from setiger 22 and knobbed setae from setiger 43, whereas *P. elongatus* lacks both setae from corresponding setigers.

Poecilochaetus elongatus resembles *P. fauchaldi* PILATO et CANTONE, 1976, from eastern Sicily in that the ampullaceous postsetal lobes are present on setigers 7–13, the median nuchal organ reaches setiger 4, and branchiae, aristate setae and knobbed setae are lacking. However, *P. elongatus* can be separated from the latter as follows: (1) the parapodial sensory organs are present from setiger 1 to 5 and 10 through the posterior, instead of setigers 1 to 5 only and (2) the membranous setae are present from setiger 7, instead of setiger 2.

Poecilochaetus elongatus also resembles *P. tropicus* OKUDA, 1935, from Palau Island, in having a long median nuchal organ. However, it is distinguishable in that

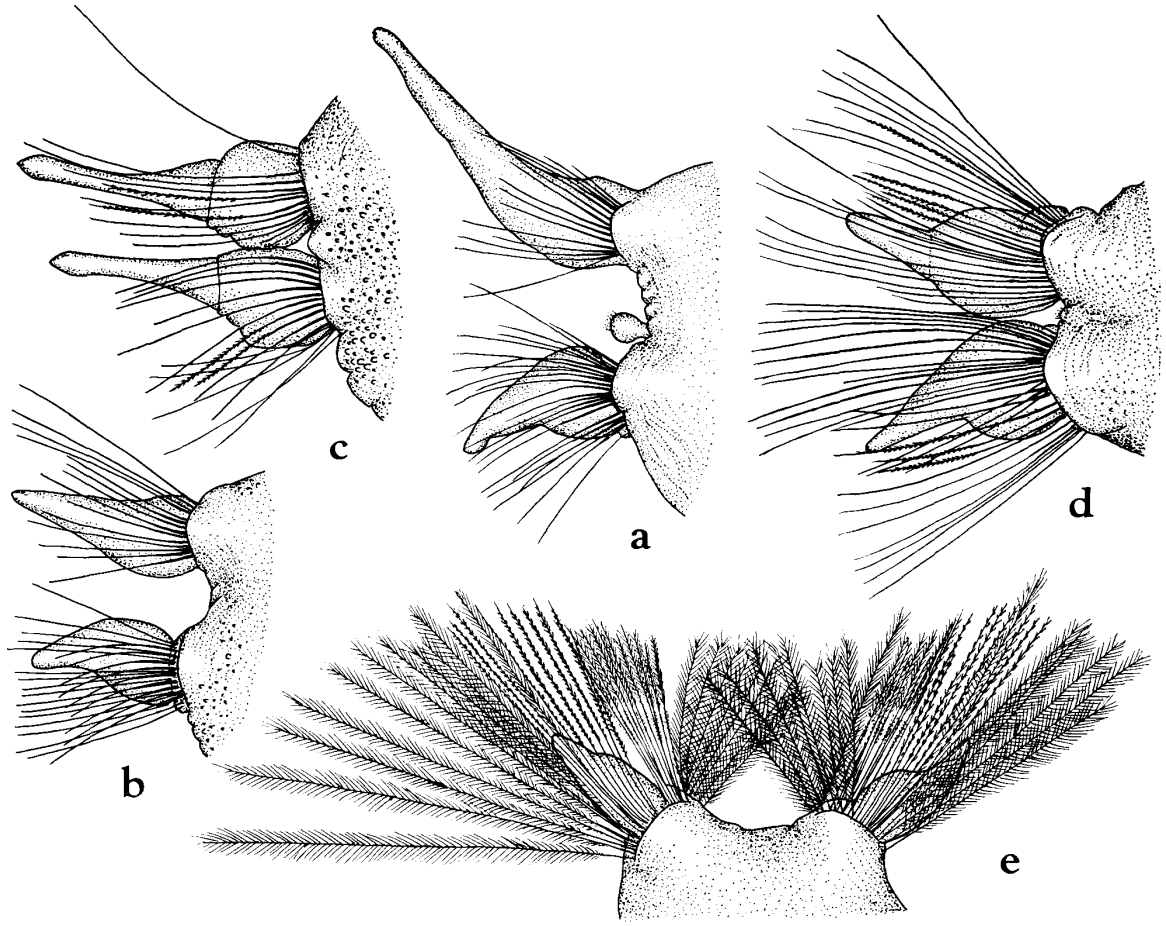


Fig. 9. *Poecilochaetus elongatus* sp. nov. —— a, Fifth parapodium, anterior view, ×54; b, sixth parapodium, anterior view, ×54; c, seventh parapodium, anterior view, ×54; d, 14th parapodium, anterior view, ×54; e, 26th parapodium, anterior view, ×54.

P. tropicus has membranous setae in the second neuropodium, instead of minutely serrated capillaries.

Poecilochaetus elongatus also resembles *P. koshikiensis* MIURA, 1988, in the absence of branchia, structure of the nuchal and parapodial sensory organs, and presence of ampullaceous lobes on setigers 7 to 13. But *P. koshikiensis* has membranous setae occurring in all parapodia from setiger 2 and aristate setae arising from setiger 48.

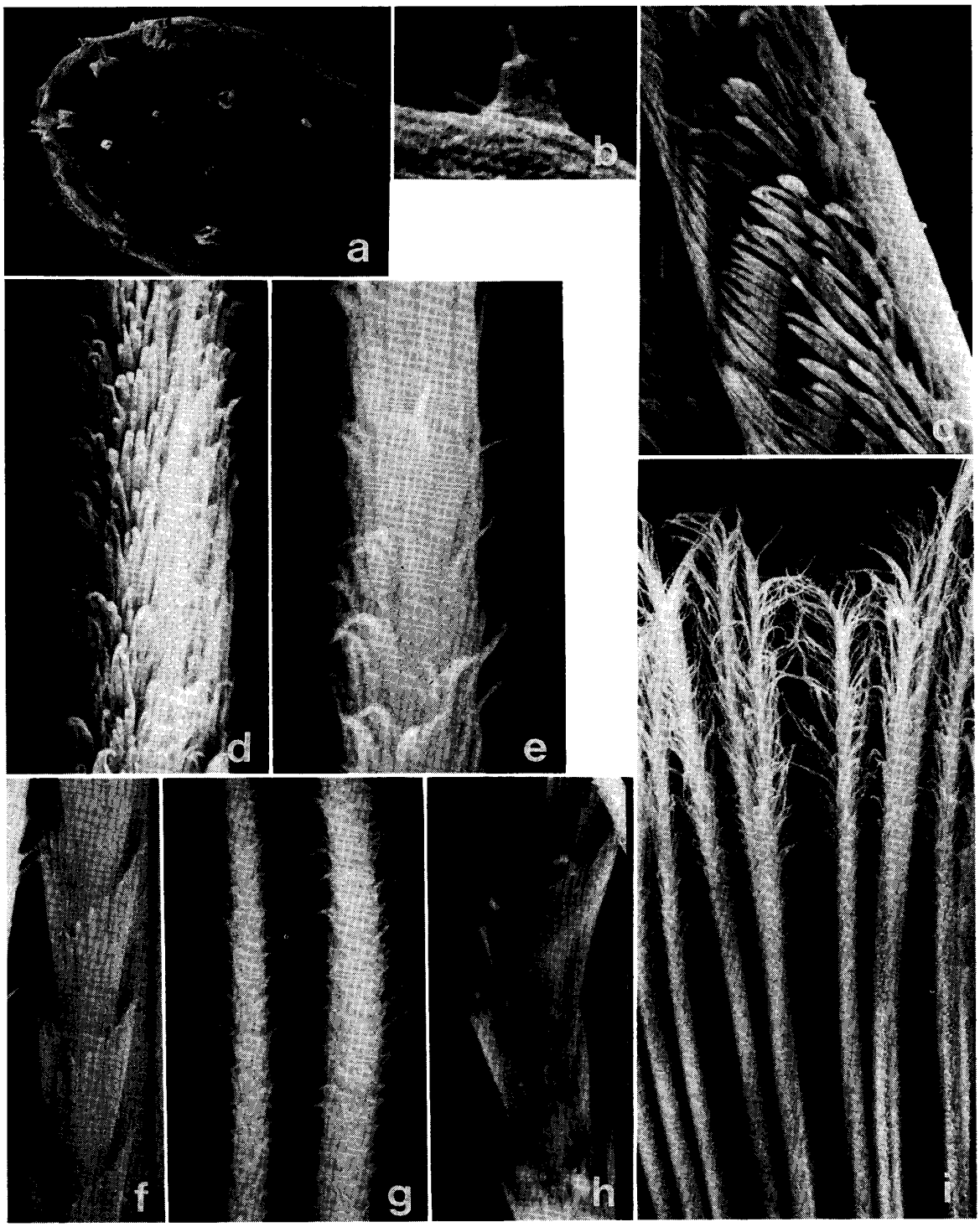
Type series. Holotype, NSMT–Pol. H 262; 1 paratype, NSMT–Pol. P 263.

Distribution. Central to southern Japan.

Poecilochaetus magnus sp. nov.

(Figs. 11 a–k, 12 a–i)

Material examined. Ariake-Kai: Kyushu, in 10 m (holotype and 15 paratypes), IX–1957.



Description. All of the specimens collected are anterior fragments. The holotype has 54 setigers, is 34 mm in length and 4.2 mm in width, including parapodia. The largest paratype is 53 mm in length and 4.5 mm in width, and consists of 80 setigers.

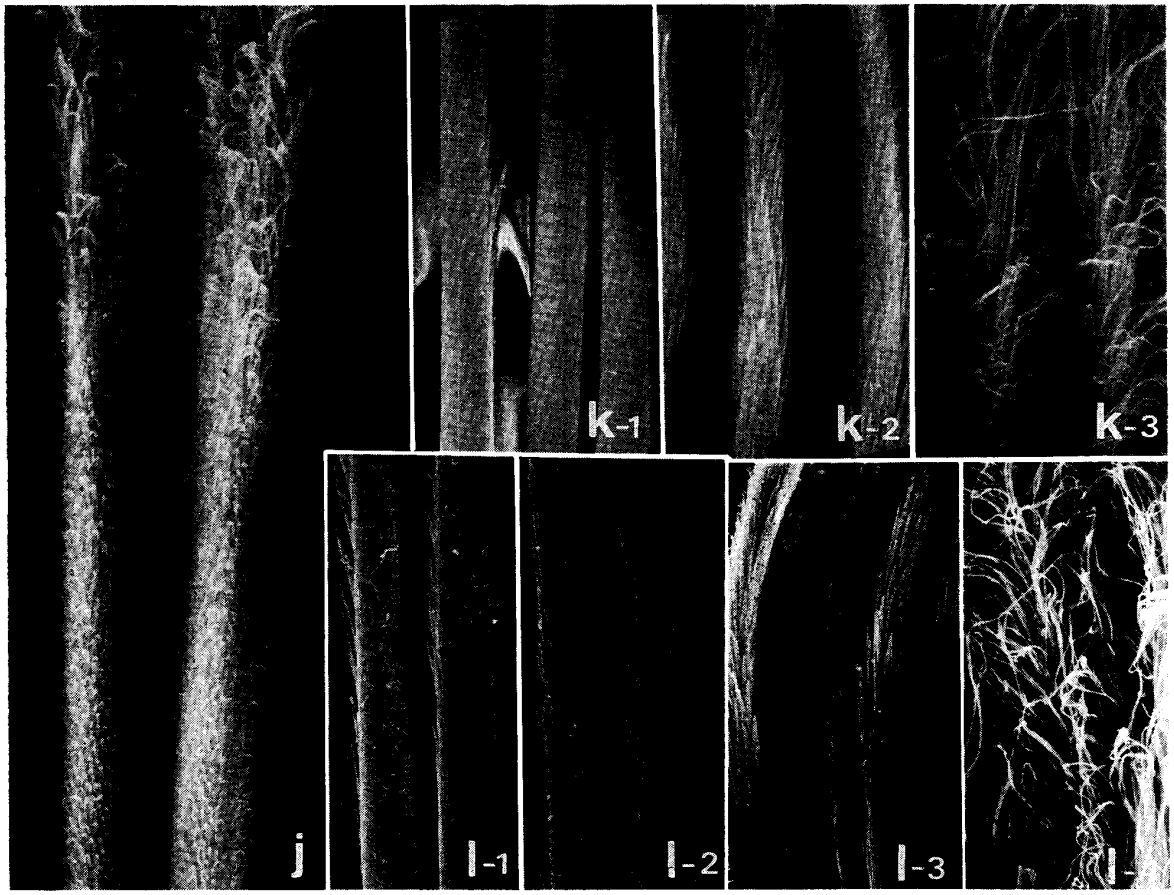


Fig. 10 (on pp. 82–83). *Poecilochaetus elongatus* sp. nov. —— a, Distal part of postsetal lobe, ×2,900; b, papilla on postsetal lobe, ×12,300; c, notopodial seta from first parapodium, ×7,400; d, thick hispid seta from sixth parapodium, ×5,800; e, slender hispid seta from same parapodium, ×11,500; f, membranous setae from seventh parapodium, ×5,800; g, hispid setae from 14th parapodium, ×5,000; h, membranous seta from same parapodium, ×5,000; i, j, fascicles of hispid-plumose setae from 17th parapodium, i, ×1,250, j, ×3,300; k, spinal-plumose setae from 20th parapodium, basal (1), medial (2) and distal (3) parts, ×3,000; l, spinal-plumose setae from 40th parapodium, basal (1), medial (2), transitional (3) and distal (4) parts, ×3,000.

The prostomium is subquadrate, with a smooth anterior margin. There are two pairs of eyespots; the anterior pair are widely separated from each other and the posterior pair are close together. The midventral cephalic organ is slightly longer than the prostomium. Of the three nuchal organs the median one reaches to setiger 3 and two lateral ones are small and discoid. A mid-dorsal chitinized structure is present on the posterior margin of setiger 9 (Fig. 11 a). The anterior ventral surface is triannulated in each segment (Fig. 11 b).

The first parapodia are directed forward; each has a short, dorsal postsetal lobe and a long, biarticulate ventral postsetal lobe. Noto- and neuropodial setae are long and smooth, and inwardly curved; they form the cephalic cage.

The second parapodia have tapering dorsal and ventral postsetal lobes (Fig. 11 c). The notopodium has a fascicle of membranous setae and hispid setae which appear as smooth capillaries under low magnification. The neuropodium has five curved, thick spines with hirsute tips (Fig. 11 d) and a small fascicle of short hispid setae. The third parapodia have noto- and neuropodial setae resembling those of the second parapodia. The following postsetal lobes through setiger 6, except setiger 5, resemble one another in general appearance. The setal fascicles of the fourth parapodia (Fig. 11 e) include only thick and slender hispid setae. The sixth parapodia (Fig. 11 f) have hispid setae and membranous setae in both rami.

Parapodia 7 to 13 have ampullaceous postsetal lobes; the bases are thick and the necks are slender with bulbous tips (Fig. 11 g). The setal fascicles consist of hispid and membranous setae (Fig. 12 a).

The 14th parapodia (Fig. 11 h) have spindle-shaped noto- and neuropodial postsetal lobes; there are short and long hispid setae and long membranous setae. The setal composition changes on the 16th parapodium (Fig. 11 i); it consists of short and long hispid setae, membranous setae and plumose setae in both rami.

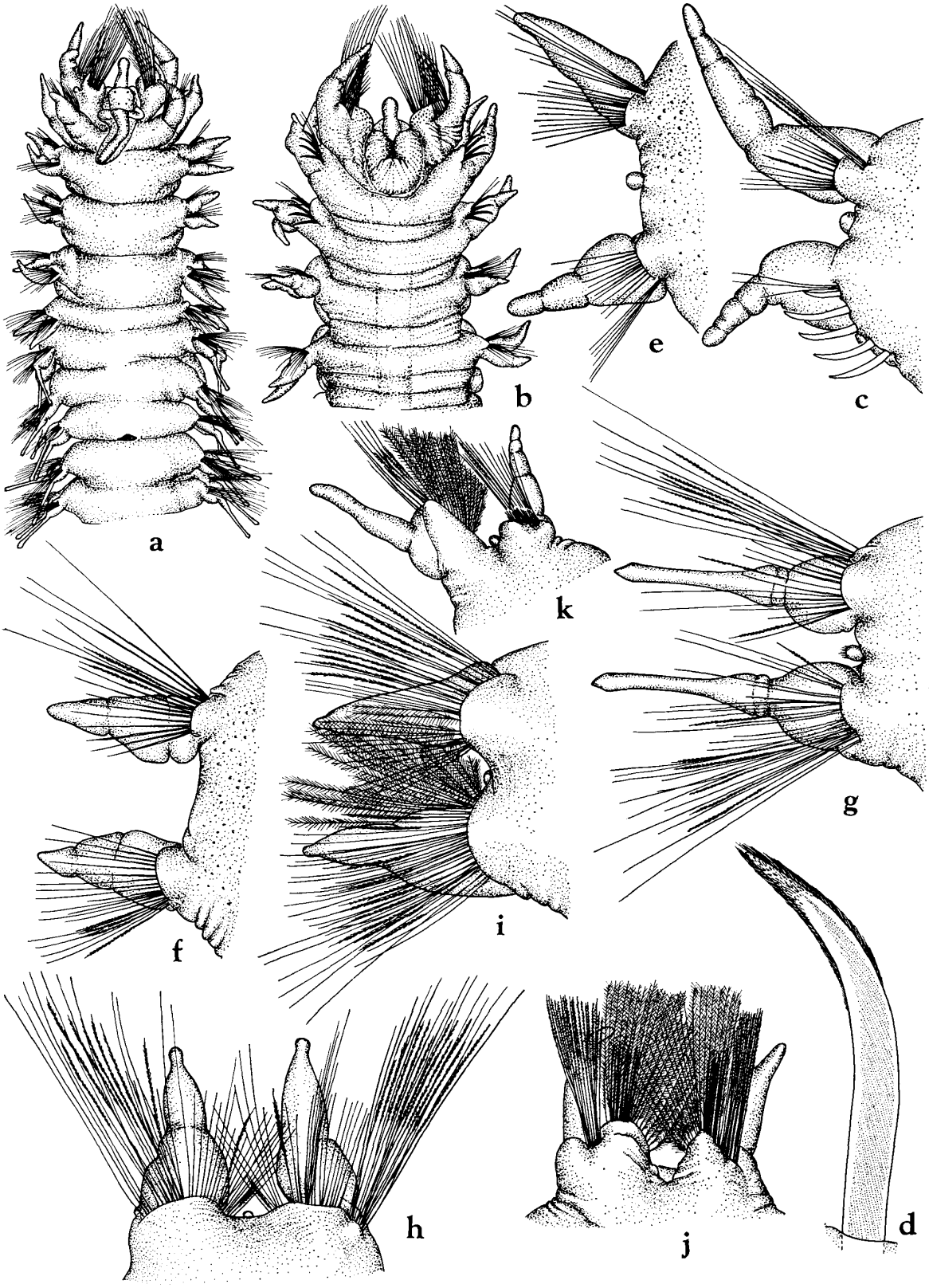
The setal fascicle of the 30th parapodium (Fig. 11 j) consists of hispid setae, plumose setae and spinal-plumose setae (Fig. 12 b) in both rami. The spinal-plumose setae have a shield in the transitive part from spinal region to plumose region (Fig. 12 c, d). From about the 40th parapodium, 4 to 5 hispid setae having a thick axis and distally slender end (Fig. 12 e, f) appear in both rami. Posterior to the 46th parapodium (Fig. 11 k) the notopodial fascicle is composed of many, short harpoon-like knobbed setae (Fig. 12 g, h), long capillaries, and a few membranous setae. They are spirally arranged from the center (Fig. 12 i). The neuropodial fascicle has spinal-plumose setae, 3–4 membranous setae and 4–5 thick hispid setae with slender tips.

Parapodial sensory organs are rounded and are present from setiger 1 through 5, and from setiger 9 through the posterior. No branchiae are seen the posterior parapodia.

Remarks. *Poecilochaetus magnus* resembles *P. ishikariensis* (described below) in having harpoon-like knobbed setae in the posterior notopodia. However, *P. magnus* is distinguishable from *P. ishikariensis* in having ampullaceous postsetal lobes on parapodia 7 to 13, instead of 7 to 12.

Poecilochaetus magnus resembles *P. australis* NONATO, 1963, from Brazilian coast, in having ampullaceous postsetal lobes on parapodia 7 to 13. However, *P. magnus* differs from *P. australis* in features of knobbed setae (barbed bristle by NONATO) and *P. australis* has aristate setae, instead of missing.

Fig. 11. *Poecilochaetus magnus* sp. nov. —— a, b, Anterior ends, dorsal (a, ×8) and ventral (b, ×12) views; c, second parapodium, anterior view, ×32; d, spine from second neuropodium, ×150; e, fourth parapodium, anterior view, ×32; f, sixth parapodium, anterior view, ×32; g, 13th parapodium, anterior view, ×32; h, 14th parapodium, anterior view, ×32; i, 16th parapodium, anterior view, ×32; j, 30th parapodium, anterior view, ×32; k, 46th parapodium, anterior view, ×32.



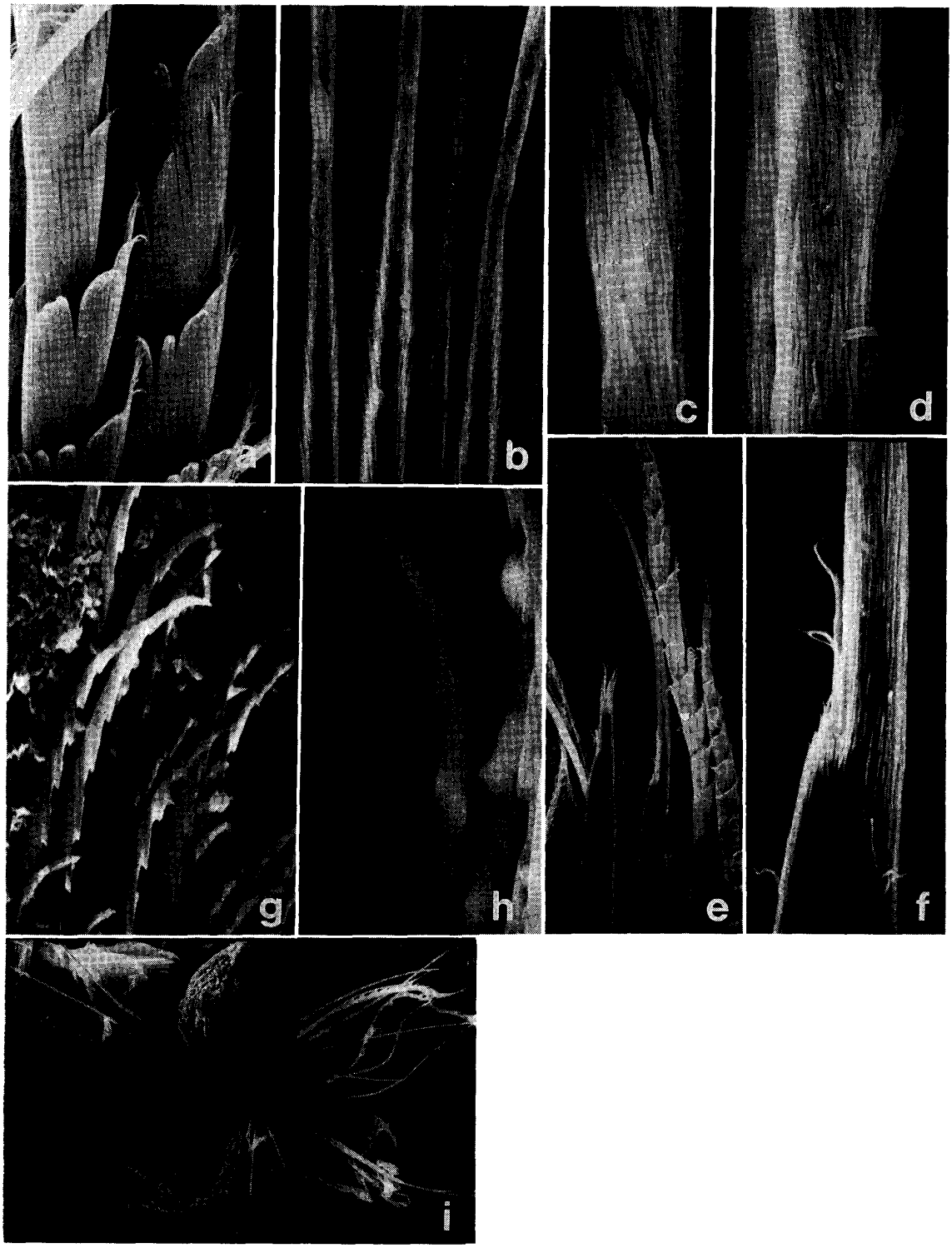


Fig. 12. *Poecilochaetus magnus* sp. nov. —— a, Membranous setae from 13th parapodium, ×5,500; b, fascicle of spinal-plumose setae from 30th parapodium, ×1,100; c, d, shields on spinal-plumose setae from 30th parapodium, ×4,800; e, fascicle of 50th neuropodium, showing hispid seta with slender distal end, ×850; f, part of same hispid seta, ×4,000; g, fascicle of knobbed setae from 50th notopodium, ×4,800; h, distal part of knobbed seta, ×9,600; i, setal fascicle from 50th notopodium, showing arrangement of dorsal setae, ×340.

Type series. Holotype, NSMT-Pol. H 264; 15 paratypes, NSMT-Pol. P 265.
Distribution. Southern Japan.

Poecilochaetus ishikariensis sp. nov.

(Figs. 13 a–o, 14 a–h)

Poecilochaetus sp.: IMAJIMA, 1988, p. 127.

Material examined. Ishikari Bay: 43°21.0′N, 140°51.4′E, in 84 m (5); 43°23.9′N, 140°55.8′E, in 84 m (1); 43°30.2′N, 141°03.6′E, in 88 m (holotype and 1 paratype), V-1987.

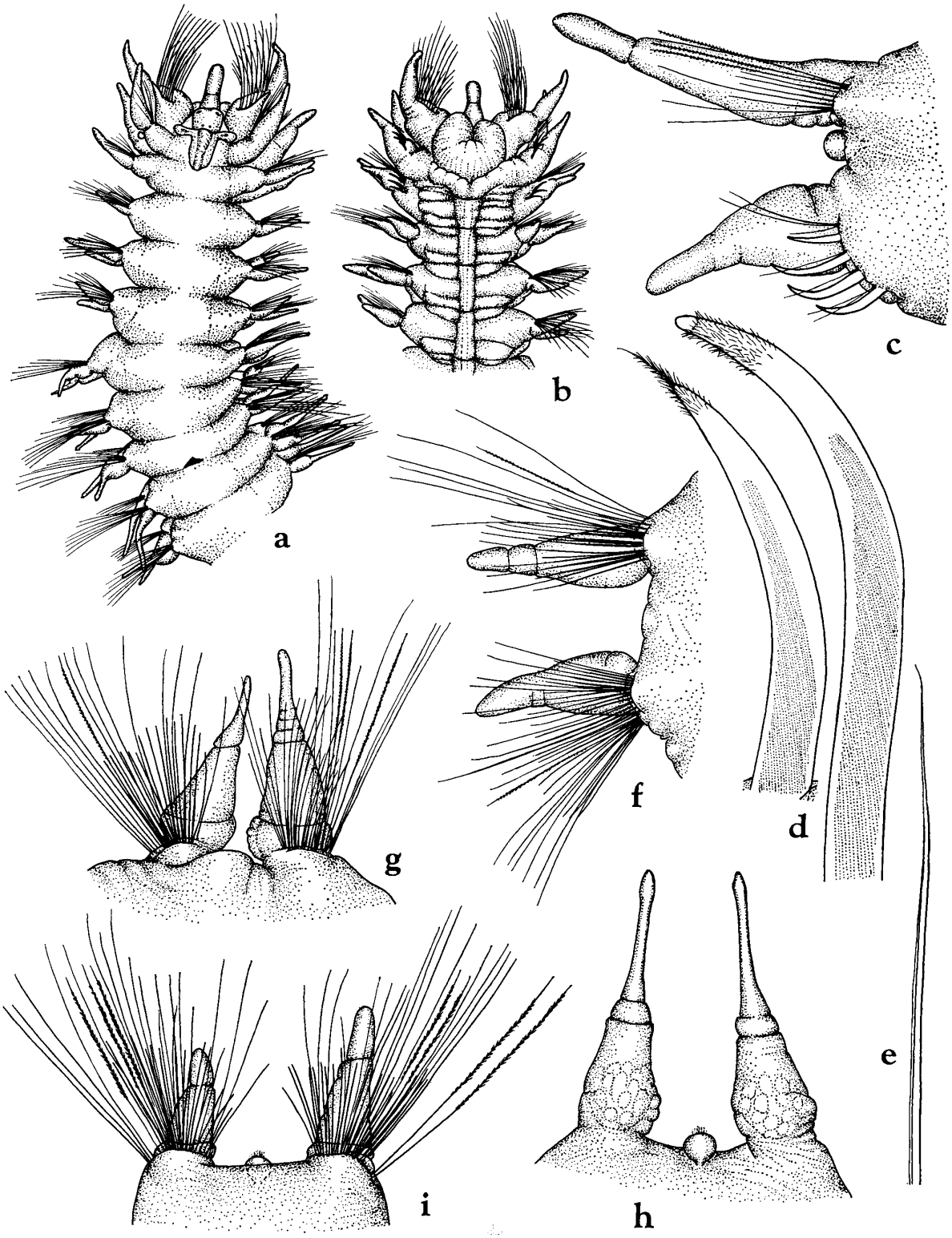
Description. All of the specimens collected are anterior fragments. The largest is the holotype, which is 21 mm in length, and about 2.3 mm in width including parapodia; it consists of 50 setigers.

The prostomium is subquadrate, with a slightly concave anterior margin. Two pairs of eyespots are present; the posterior pair are small, embedded and close together and the anterior pair are large and separated from each other. Nuchal organs include three processes; the median one reaches to the anterior part of setiger 3 and two lateral ones are small and discoid. The midventral cephalic organ is longer than the prostomium; it appears biarticulate. A mid-dorsal chitinized structure is present on the posterior margin of setiger 9. The ventral body surface is triannulated (Fig. 13 a, b).

The first parapodia are directed forward; each has a short dorsal postsetal lobe and a long ventral postsetal lobe. Notosetae are long, smooth, and inwardly curved, forming the cephalic cage. Neurosetae are also smooth, but shorter than the notosetae. Each of the second parapodia has a long, biarticulate dorsal postsetal lobe and spindle-like, ventral postsetal lobe which is shorter than that of the notopodium (Fig. 13 c). The notopodium has a superior fascicle of membranous setae (Fig. 14 a) and an inferior fascicle of slender capillaries. The neuropodium has three kinds of setae: four curved spines with hirsute tips (Fig. 13 d) accompanied by a few fine limbate capillaries (Fig. 13 e) and a tiny fascicle of a few fine capillaries in the superior position. The third parapodia have noto- and neurosetae resembling those of the second parapodia.

The following postsetal lobes through setiger 6 (Fig. 13 f), except the 5th setiger, resemble one another in general appearance. Each is spindle-shaped and of subequal size, with scattered minute tubercles (Fig. 14 b). Both rami of the fourth parapodia have membranous setae (Fig. 14 c), short and thick hispid setae (Fig. 14 d), and long and slender hispid setae (Fig. 14 e). These hispid setae appear as smooth capillaries under low magnification.

Ampullaceous postsetal lobes with bulbous tips are present on the parapodia 7 (Fig. 13 g) through 12 (Fig. 13 h); these lobes have hispid setae and membranous setae. From the 13th parapodium both noto- and neuropodial postsetal lobes are replaced by the normal form (Fig. 13 i). After the 17th parapodium plumose setae (Fig. 14 f) arise from the proximal portions of the fascicles in both noto- and neuropodia. Both



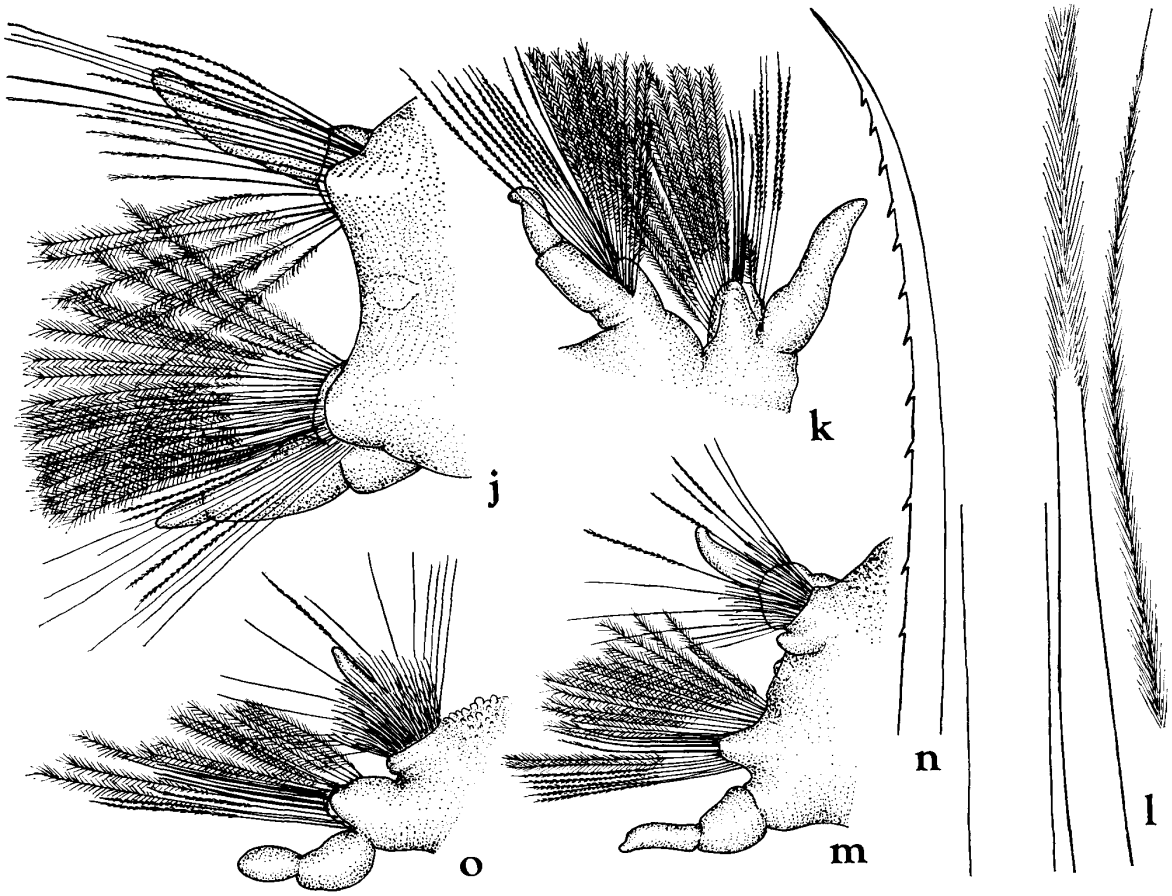


Fig. 13 (on pp. 88–89). *Poecilochaetus ishikariensis* sp. nov. —— a, b, Anterior ends, dorsal (a) and ventral (b) views, ×15; c, second parapodium, anterior view, ×52; d, thick spines from second parapodium, ×320; e, limbate capillary seta associate with spine, ×320; f, sixth parapodium, anterior view, ×52; g, seventh parapodium, anterior view, ×52; h, 12th parapodium ommited setae, posterior view, ×52; i, 13th parapodium, anterior view, ×54; j, 20th parapodium, anterior view, ×54; k, 30th parapodium, posterior view, ×54; l, thick simple seta with hirsute tip, ×840; m, 37th parapodium, anterior view, ×54; n, knobbed seta, ×2,380; o, 50th parapodium, anterior view, ×54.

rami of the 20th parapodium (Fig. 13 j) have long hispid setae, membranous, and plumose setae (Fig. 14 g) arranged in a fan. The 30th parapodium (Fig. 13 k) is smaller than the 20th parapodium and has a fascicle of membranous setae, plumose setae and thick aristate setae with distally hirsute ends (Fig. 13 l). From the 37th parapodium (Fig. 13 m) the fascicles of notosetae are replaced by a large number of short, harpoon-like knobbed setae (Fig. 13 n), long hispid setae, and membranous setae; these setae are spirally arranged around the tip of an aciculum. The neurosetae consist of plumose setae, membranous setae and thick aristate setae with hirsute ends. The knobbed setae on the notopodia are crowded in proportion to the posterior parapodia (Fig. 13 o).

Parapodial sensory organs are present from setiger 1 through 5, and from setiger

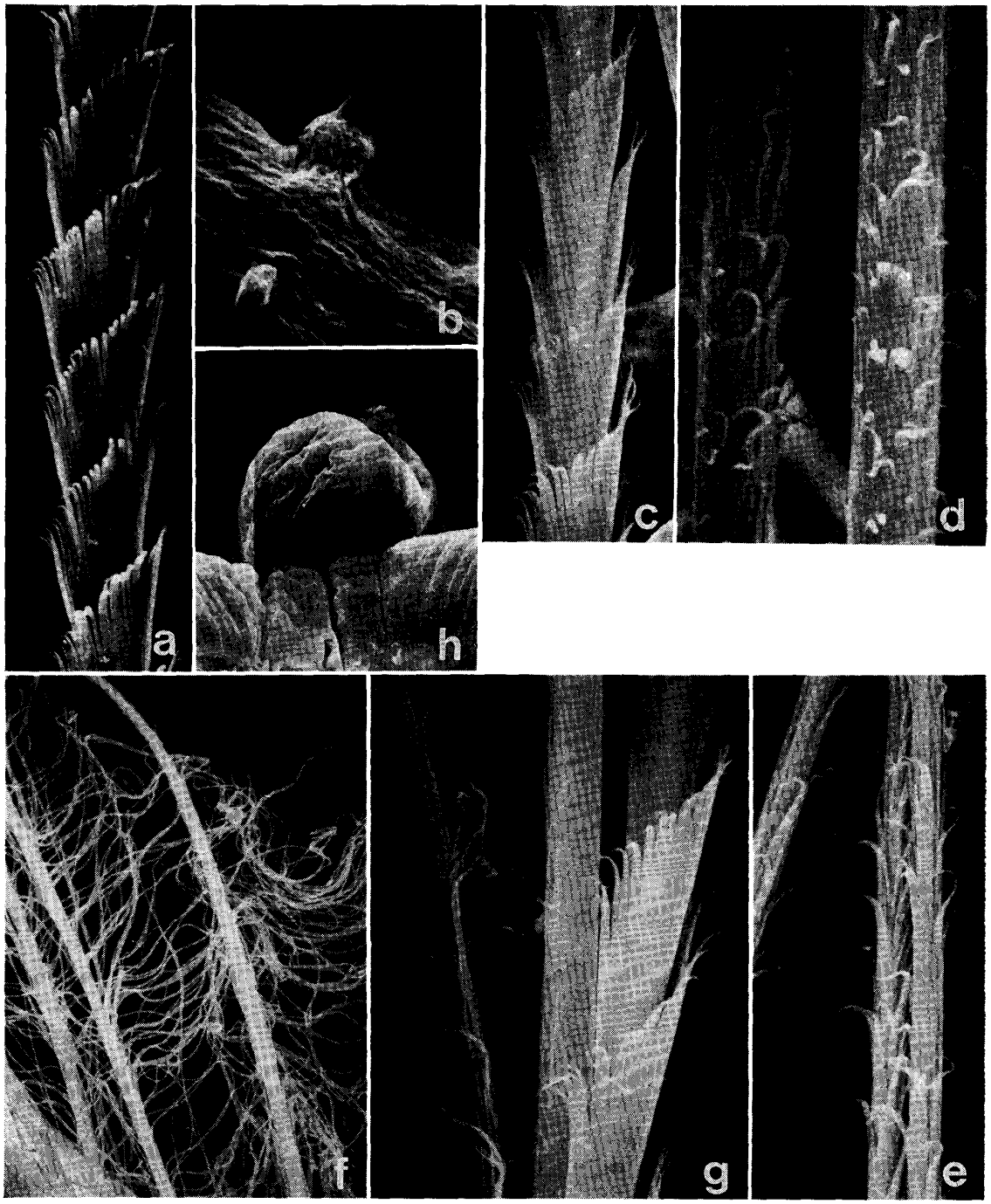


Fig. 14. *Poecilochaetus ishikariensis* sp. nov. —— a, Membranous setae from second notopodium, ×4,200; b, tubercles on postsetal lobe, ×6,300; c, membranous seta from fourth parapodium, ×6,000; d, thick hispid setae from same parapodium, ×8,800; e, slender hispid setae from same parapodium, ×6,000; f, plumose setae from 17th parapodium, ×2,500; g, plumose, hispid and membranous setae from 20th parapodium, ×6,000; h, parapodial sensory organ, ×840.

9 through the posterior (Fig. 14 h). No branchiae are seen on the 50 setigers of the holotype.

Remarks. *Poecilochaetus ishikariensis* is related to *P. bermudensis* HARTMAN, 1965, from off Bermuda, in 1,000 m, in having the ampullaceous postsetal lobes from the 7th through the 12th parapodia. However, *P. ishikariensis* is distinguished from *P. bermudensis* by the following characteristics: (1) median nuchal organ extends to setiger 3, instead being a papillar elevation and (2) a mid-dorsal chitinized structure is present on setiger 9, instead of lacking. *P. bermudensis* is an anterior fragment consisting of 16 segments, so that the presence of the knobbed setae on the posterior notopodia are not known.

Type series. Holotype, NSMT-Pol. H 266; paratype, NSMT-Pol. P 267.

Distribution. Ishikari Bay, in 84–88 m, Hokkaido.

Poecilochaetus clavatus sp. nov.

(Figs. 15 a–r, 16 a–g)

Material examined. Off Akita: 39°47′N, 139°50′E, in 70 m (1); 39°47′N, 139°48′E, in 80 m (holotype and 4 paratypes including 1 autotomized posterior end), VIII-1982.

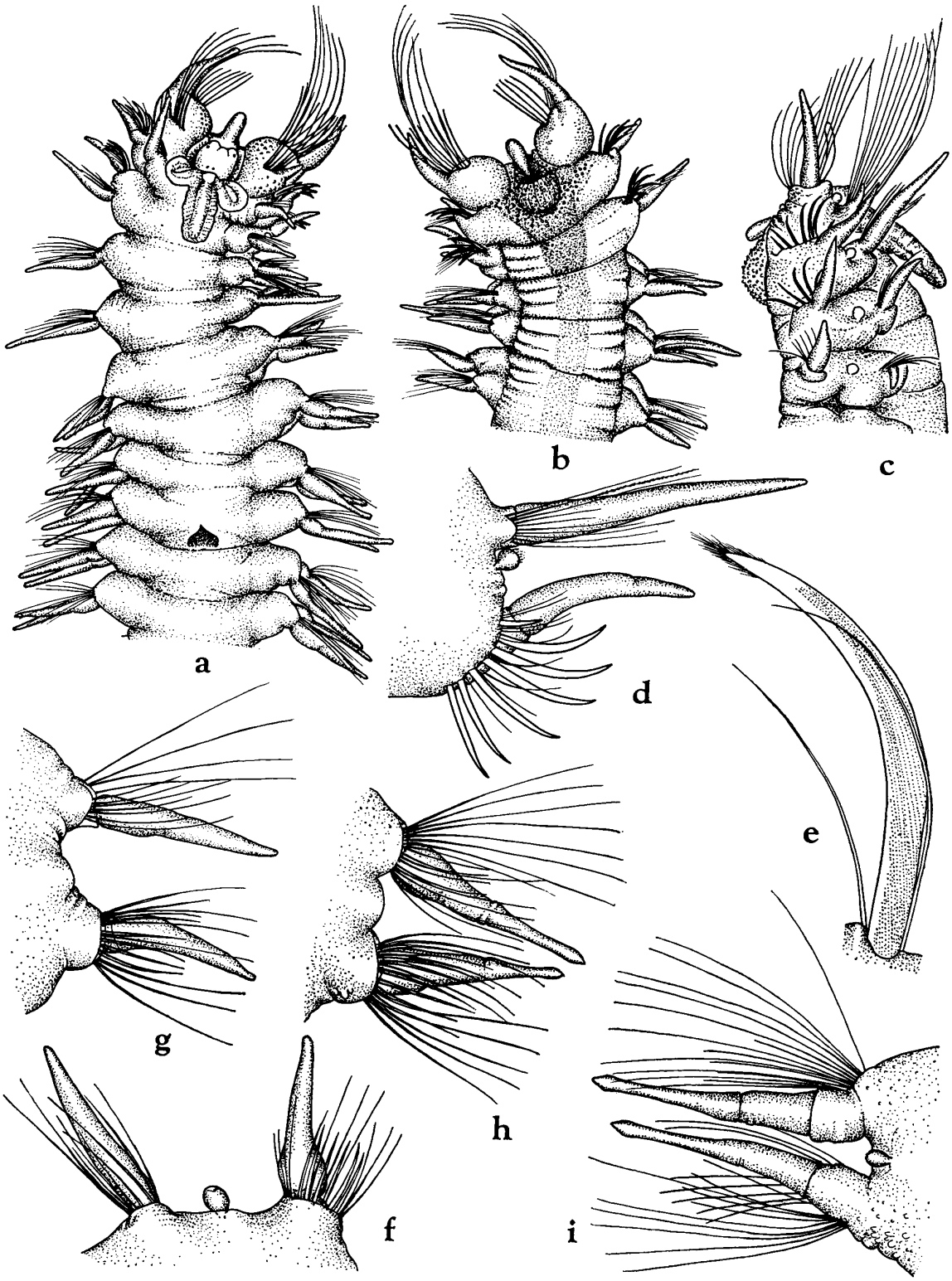
Description. Specimens collected are 5 anterior fragments and 1 posterior end. The largest anterior fragment is the holotype, which is 9 mm in length, and about 2 mm in width including parapodia; it consists of 24 setigers.

The prostomium is subquadrate; there are two minute eyespots near its posterior margin, and two somewhat larger eyespots near the anterior margin. The midventral cephalic organ is cylindrical and as long as the prostomium.

The nuchal organs include three processes: the median one reaches to setiger 3 and the two lateral ones are discoid. The surface epithelium is nearly smooth except for small dispersed papillae which are mainly concentrated on the regions about the mouth and the first parapodia. On the middorsum of setiger 9 there is a chitinous, chestnut-shaped, elevated structure (Fig. 15 a, b).

The first parapodia are largest and directed obliquely forward; the dorsal postsetal lobe is small, but the ventral postsetal lobe is slender and tapering (Fig. 15 c). The noto- and neurosetae are smooth capillaries and distally curved inwards; those setae form the cephalic cage.

The second parapodia have long, tapering dorsal and ventral postsetal lobes (Fig. 15 d); notosetae are slender capillaries and 1 membranous seta, and neurosetae are seven curved, thick spines with hirsute tips, in transverse series, and accompanied by very slender capillaries (Fig. 15 e). The setae of the third parapodia are similar to the second. The following postsetal lobes through setiger 6 are slender and distally tapering (Fig. 15 f, g); noto- and neurosetae consist of short and thick hispid setae (Fig. 16 a) and long and slender hispid setae (Fig. 16 b). Those hispid setae appear as smooth capillaries under low magnification.



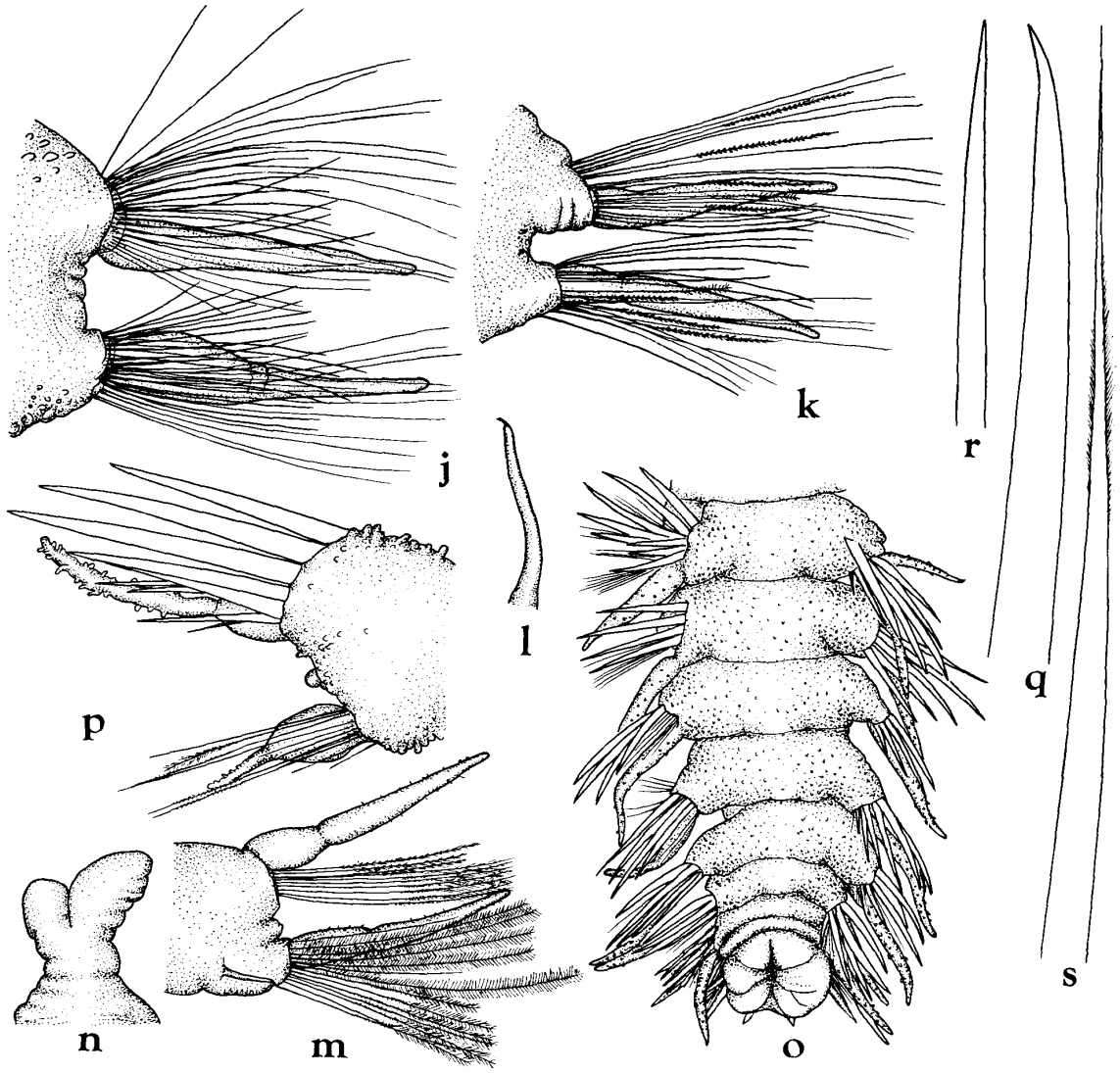


Fig. 15 (on pp. 92–93). *Poecilochaetus clavatus* sp. nov. —— a–c, Anterior ends, dorsal (a, ×17), ventral (b, ×17) and lateral (c, ×24) views; d, second parapodium, anterior view, ×50; e, setae of second neuropodium, ×208; f, fourth parapodium, anterior view, ×50; g, sixth parapodium, anterior view, ×50; h, seventh parapodium, anterior view, ×50; i, 10th parapodium, posterior view, ×50; j, 11th parapodium, anterior view, ×54; k, 16th parapodium, anterior view, ×54; l, interramal cirrus from 20th parapodium, ×168; m, 20th parapodium, anterior view, ×54; n, branchia from 24th parapodium, ×114; o, posterior end, dorsal view, ×30; p, posterior parapodium, anterior view, ×54; q, r, spines from posterior notopodium, ×168; s, simple seta with hairs from posterior neuropodium, ×330.

Setigers 7–10 have ampullaceous postsetal lobes with somewhat slender bases and bulbous tips (Fig. 15 h, i). Their setae are all thick or slender hispid setae in both noto- and neuropodia. From setiger 11 (Fig. 15 j) onwards they are like those anterior to setiger 7. Again the membranous setae appear from the fascicle of setiger

12. The setal fascicle of setiger 16 (Fig. 15 k) has hispid setae (Fig. 16 c) and membranous setae (Fig. 16 d) and 1 hispid-plumose seta in each podium. An interramal cirrus arises from the anterior surface of the 16th parapodium; it is slender and terminates in a minute tip (Fig. 15 l).

From setiger 17 plumose setae appear in the neuropodium. The hispid-plumose setae (Fig. 16 e) increase in number in setiger 20 (Fig. 15 m) and those setae are replaced by spinal-plumose setae from setiger 23. The membranous setae are well developed (Fig. 16 f). The setae of the fascicle of setiger 23 are arranged as follows: spinal-plumose setae (Fig. 16 g), membranous setae, spinal-plumose setae and plumose setae from the distal portion of the fascicle in the notopodium: plumose setae, spinal-plumose setae, membranous setae and plumose setae from the proximal portion of the fascicle in the neuropodium.

Branchiae appear from setiger 20 as one lobe; they are bilobed from setiger 22 (Fig. 15 n).

Parapodial sensory organs are present from setiger 1 through 5, and from setiger 10 through the posterior.

The last 20 setigers (Fig. 15 o) are characteristic: (1) noto- and neuropodial postsetal lobes are flask-shaped with many large tubercles along the neck (Fig. 15 p); (2) the notopodium has remarkable thick (Fig. 15 q) to slender (Fig. 15 r) spines; (3) the neuropodium has hispid setae, membranous setae, spinal-plumose setae and subdistally serrated simple setae (Fig. 15 s). The pygidium has a smooth anal margin except for two short ventral cirri.

Remarks. *Poecilochaetus clavatus* is unique from other species of this genus in the following characteristics; (1) the ampullaceous postsetal lobes are only present in setigers 7 to 10 and (2) the interramal cirri arise from the anterior surface of the 16th parapodia.

Type series. Holotype, NSMT-Pol. H 268; 4 paratypes, NSMT-Pol. P 269.

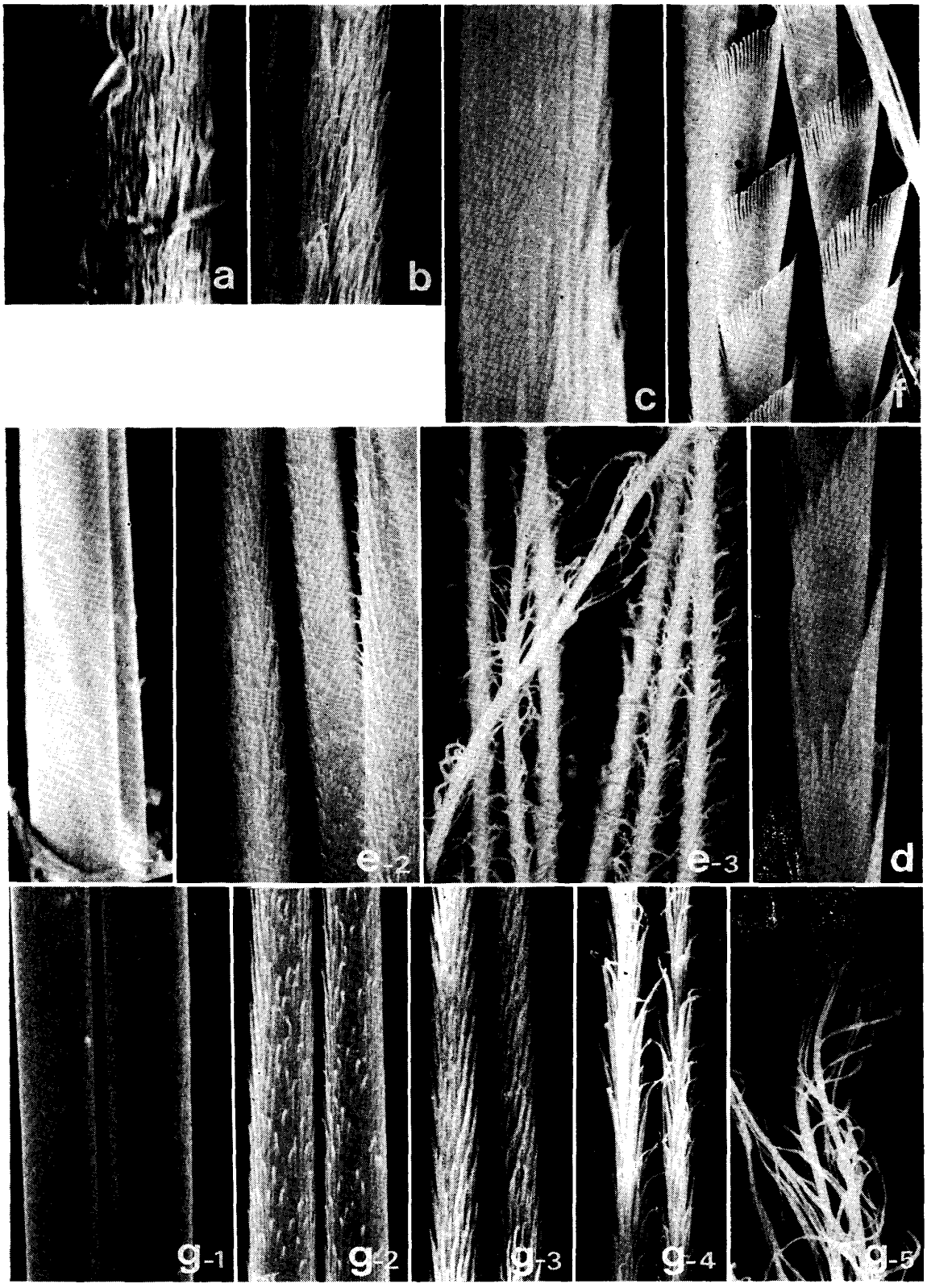
Distribution. Off Akita, in 70–80 m, northern Honshu.

Poecilochaetus granulatus sp. nov.

(Figs. 17 a–e, 18 a–h, 19 a–i)

Material examined. Off Shimoda: 34°40.9′N, 139°01.1′E–34°40.5′N, 139°00.9′E, in 120–102 m (1); 34°41.1′N, 139°00.0′E–34°40.9′N, 138°59.9′E, in 55–50 m (1); 34°39.9′N, 139°00.1′E–34°39.6′N, 139°00.0′E, in 70–63 m (1); 34°44.9′N, 139°02.2′E–34°45.0′N, 139°01.9′E, in 85–57 m (14); 34°45.0′N, 139°02.1′E–34°45.1′N, 139°02.1′E,

Fig. 16. *Poecilochaetus clavatus* sp. nov. — a, Thick hispid seta from sixth parapodium, ×7,500; b, slender hispid seta from same parapodium, ×5,000; c, hispid seta from 16th parapodium, ×11,600; d, membranous seta from same parapodium, ×5,800; e, hispid-plumose setae from 20th parapodium, basal (1), medial (2) and distal (3) parts, ×4,000; f, membranous setae from 23rd parapodium, ×2,300; g, spinal-plumose setae from same parapodium, basal (1) through distal (5) parts, ×4,000.



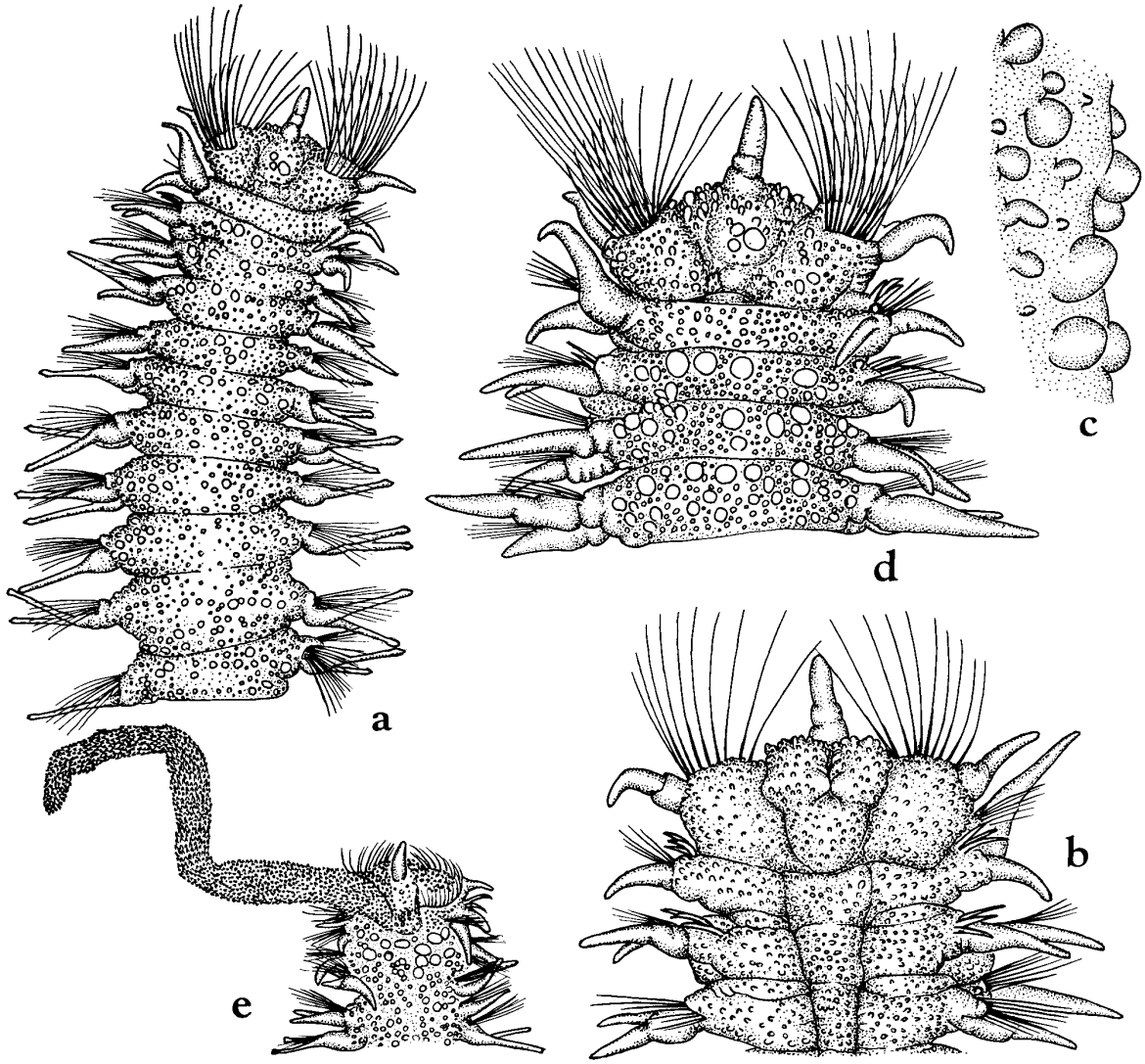


Fig. 17. *Poecilochaetus granulatus* sp. nov. —— a, Anterior end, dorsal view, ×20; b, anterior end, ventral view, ×35; c, papillae on body, ×94; d, anterior end, dorsal view, ×35; e, anterior end of paratype, showing left palp, dorsal view, ×20.

in 80–51 m (9), X–1981. Sagami Bay: 35°17.8′N, 139°32.0′E, in 15 m (1), VII–1979. Suruga Bay: 34°54.4′N, 138°27.7′E–34°54.4′N, 138°28.0′E, in 56–64 m (holotype and 1 paratype), II–1978. Off Kushimoto: 33°27.4′N, 135°44.2′E, in 45 m (1), VII–1978. Off Tanegashima: 30°34.4′N, 131°06.4′E, in 90 m (1), VI–1975.

Description. All of the specimens collected are anterior fragments. The holotype is 7 mm in length and about 2 mm in width including parapodia; it consists of 23 setigers. The body is conspicuously papillated all over; the papillae are globular in form but variable in size (Fig. 17 a–c).

The prostomium is subspherical, and has two pairs of small eyespots; anterior pair located at the frontal margin and posterior pair near posterior margin of the

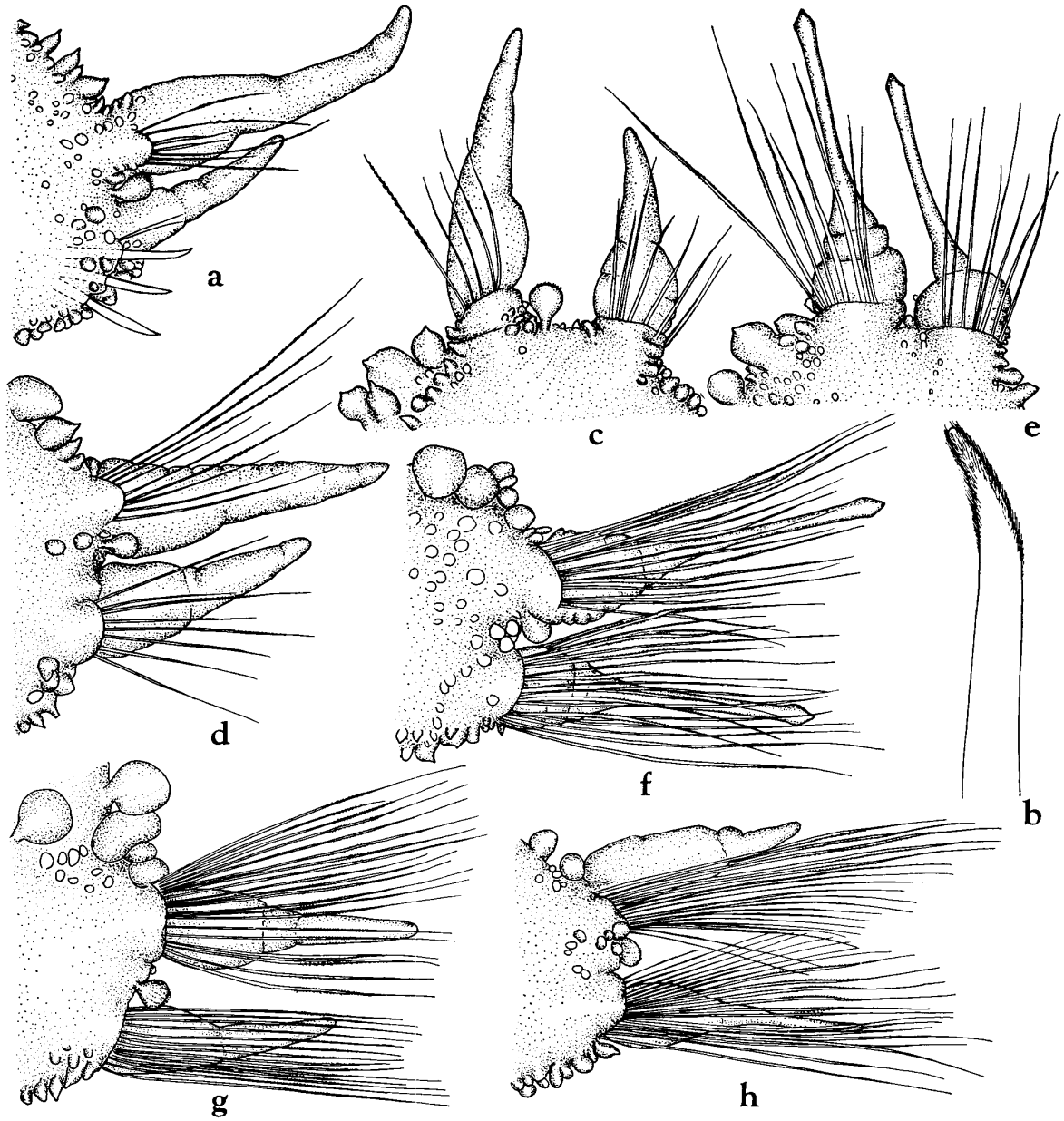


Fig. 18. *Poecilochaetus granulatus* sp. nov. —— a, Second parapodium, anterior view, ×77; b, spine from second neuropodium, ×280; c, fourth parapodium, anterior view, ×77; d, sixth parapodium, anterior view, ×77; e, seventh parapodium, anterior view, ×70; f, 17th parapodium, anterior view, ×70; g, 18th parapodium, anterior view, ×70; h, 23rd parapodium, anterior view, ×70.

prostomium. A cirriform cephalic organ is inserted at its midfrontal margin. The nuchal organs are represented by conical elevations behind the prostomium (Fig. 17 d). In one of the paratypes a long, grooved palp remains on the left side of the prostomium; it is conspicuously papillated all over (Fig. 17 e). The palps of the other specimens are fallen away, but their bases are clearly visible.

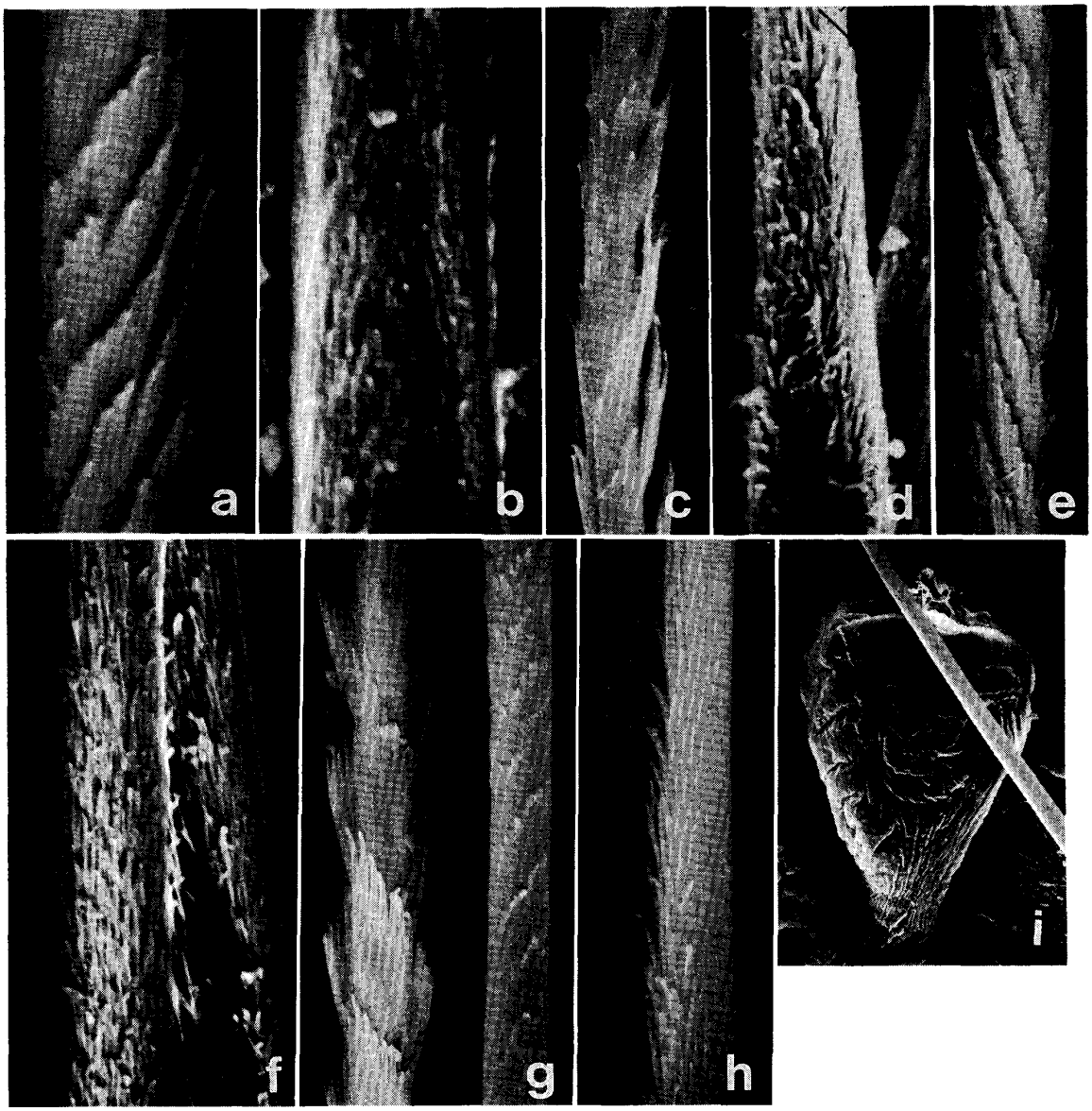


Fig. 19. *Poecilochaetus granulatus* sp. nov. —— a, Membranous seta from second notopodium, ×9,200; b, hispid seta from second notopodium, ×9,200; c, membranous seta from fourth parapodium, ×6,100; d, hispid setae from fourth parapodium, ×6,100; e, membranous seta from seventh parapodium, ×4,300; f, hispid setae from seventh parapodium, ×6,100; g, membranous setae from 18th parapodium, ×4,300; h, hispid seta from 18th parapodium, ×6,100; i, parapodial sensory organ, ×1,700.

The first parapodia are largest and biramous; each has full spreading noto- and neuropodial setae, directed forward; the ventral cirrus is somewhat spindle-shaped.

The second parapodia have long, tapering dorsal and ventral cirri; the dorsal cirrus is about two times as long as the ventral ones (Fig. 18 a). The notopodium has a fascicle of closely coiling membranous setae (Fig. 19 a) and hispid setae with a slender

distal end (Fig. 19 b). The neuropodium has three curved, thick spines with hirsute tips (Fig. 18 b) and a small fascicle of short hispid setae. The third parapodia are similar to the second. Each of the following parapodia through setiger 6 has spindle-shaped dorsal and ventral postsetal lobes (Fig. 18 c, d); the noto- and neuropodia have fascicles of membranous setae (Fig. 19 c) and hispid setae (Fig. 19 d).

Parapodia 7 to 17 have ampullaceous postsetal lobes with thickened bases and long distal ends (Fig. 18 e, f); each has a fascicle of membranous setae (Fig. 19 e) and hispid setae (Fig. 19 f). From the 18th parapodium, the dorsal and ventral postsetal lobes are like those anterior to parapodium 7, but their lobes gradually diminish in size posteriorly (Fig. 18 g, h). The setal fascicles consist of many slender membranous setae (Fig. 19 g) and a few hispid setae (Fig. 19 h) which are arranged at the outer ends of a series.

Parapodial sensory organs are pyriform (Fig. 19 i), and are present from setiger 1 through 6, and from setiger 13 through posterior fragment. Branchiae are absent in material examined, the largest of which consists of 23 setigers.

Remarks. *Poecilochaetus granulatus* is related to *P. fulgoris* CLAPARÈDE *in* EHLERS, 1875, from France in that the body is conspicuously papillated all over. However, *P. granulatus* is unique from other species of this genus in having 11 pairs of ampullaceous postsetal lobes, in setigers 7 through 17.

Type series. Holotype, NSMT–Pol. H 270, 1 paratype, NSMT–Pol. P 271.

Distribution. Central to southern Japan.

Poecilochaetus bifurcatus sp. nov.

(Figs. 20 a–l, 21 a–h)

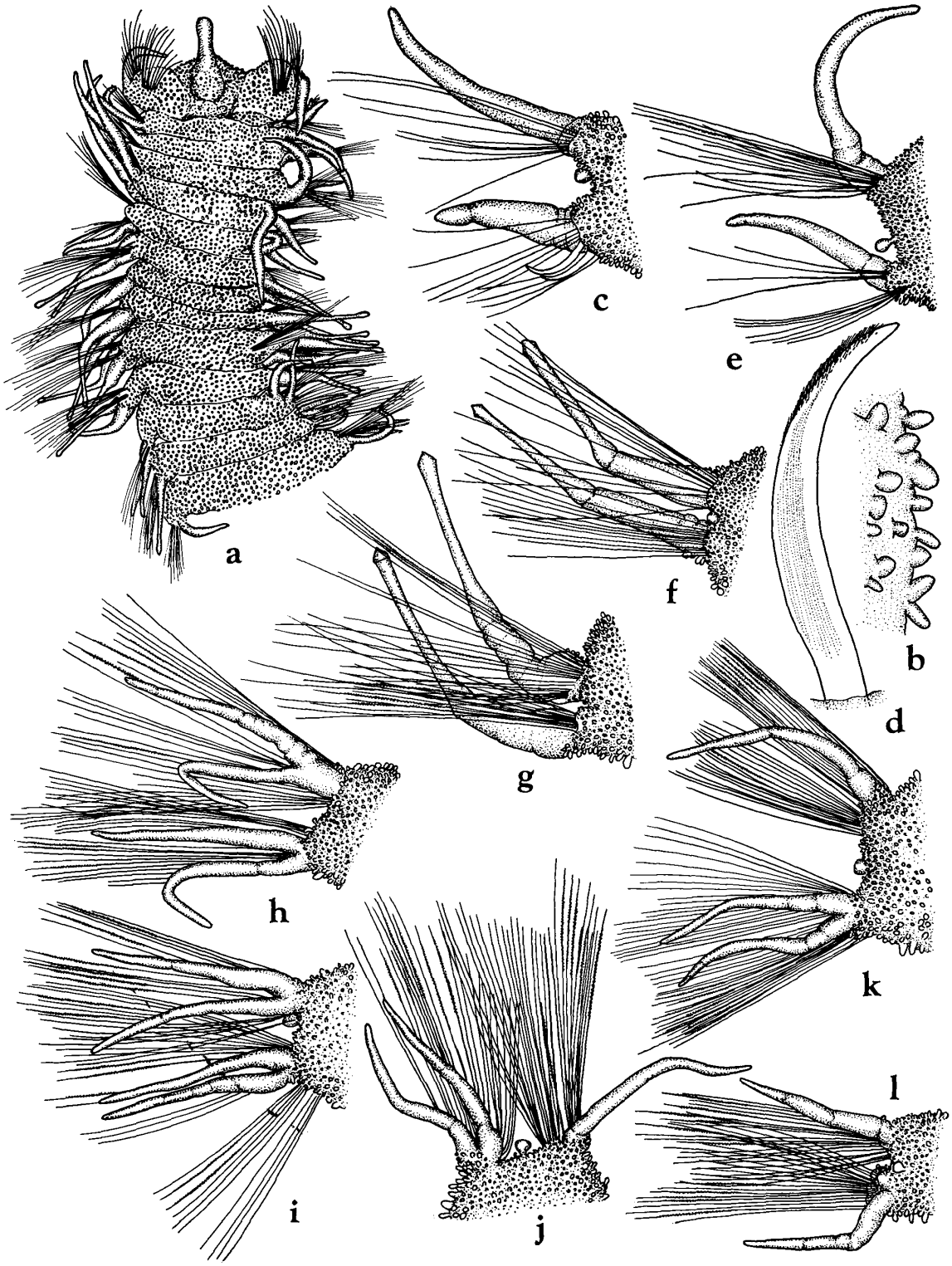
Material examined. Off Izu-Oshima: 34°42.7′N, 139°27.7′E–34°42.9′N, 139°27.7′E, in 30–75 m (holotype and 1 paratype), VII–1977.

Description. Two anterior body fragments were collected. The holotype is 6 mm in length and about 3.5 mm in width including parapodia; it consists of 16 setigers. The body is conspicuously papillated all over; all papillae are minute and subequal in size (Fig. 20 a, b).

The prostomium is subspherical; it has two pairs of small eyespots, with the anterior pair located at the frontal margin. The posterior pair are close together at the posterior margin of the prostomium. A long cephalic organ is inserted at its mid-frontal margin. The nuchal organs are represented by three papillar elevations behind the prostomium (Fig. 20 a).

The first parapodia are largest and biramous; each has spreading noto- and neuropodial setae. The ventral postsetal lobe is long and cirriform, but the dorsal postsetal lobe is rudimentary.

The second parapodia have tapering dorsal and ventral postsetal lobes, the dorsal the larger (Fig. 20 c). Parapodia 2 and 3 have each 2 or 3 heavy falcate spines in the neuropodia (Figs. 20 d, 21 a) in addition to a fascicle of long, hispid setae (Fig. 21 b).



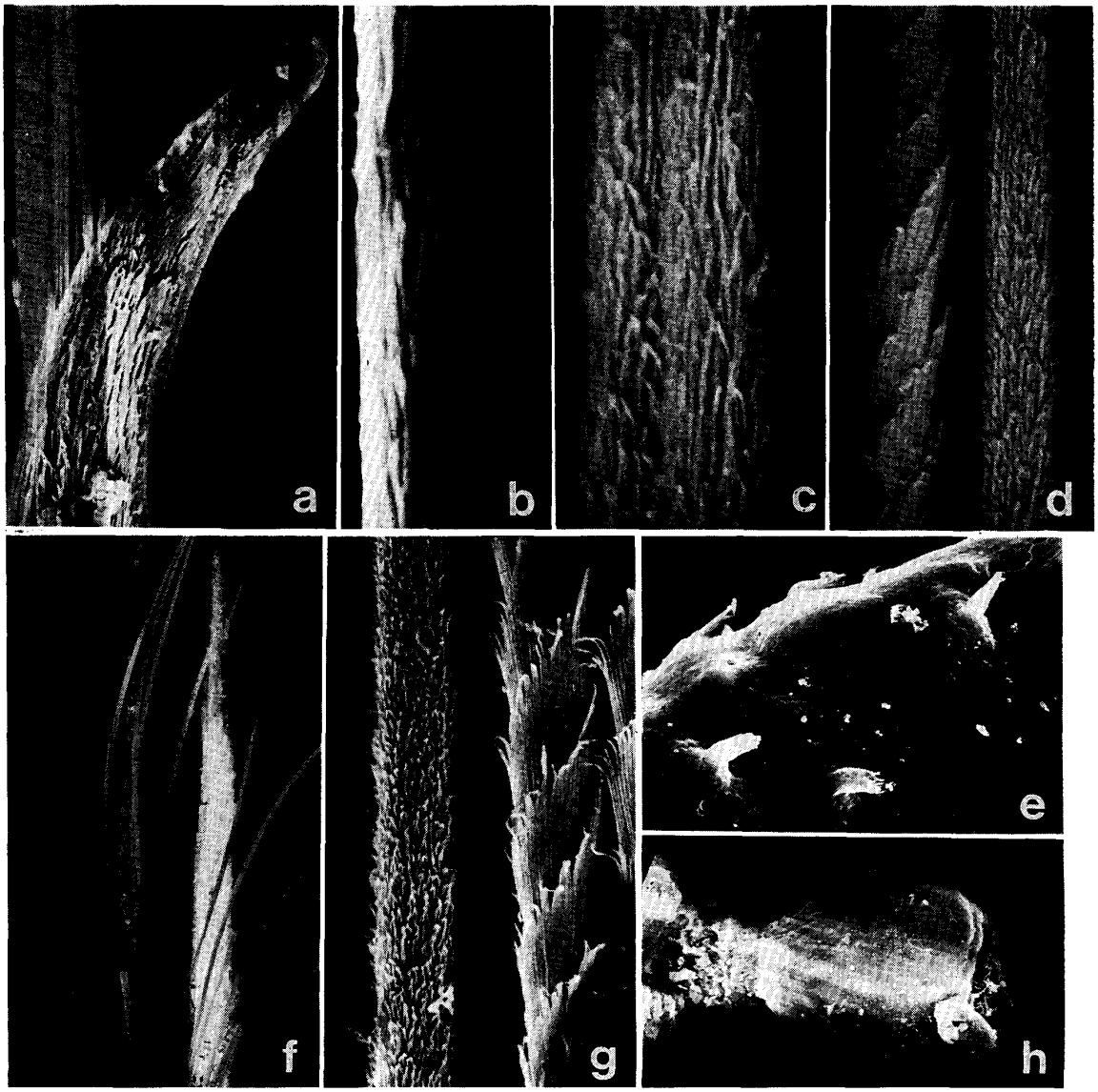


Fig. 21. *Poecilochaetus bifurcatus* sp. nov. —— a, Distal part of spine from second neuropodium, ×2,300; b, hispid seta from second neuropodium, ×8,400; c, hispid seta from second notopodium, ×8,400; d, hispid and membranous setae from fourth notopodium, ×4,000; e, part of postsetal lobe, showing tubercles, ×2,800; f, postsetal lobe from 13th neuropodium, anterior view, ×170; g, membranous and hispid setae from 13th parapodium, ×4,000; h, parapodial sensory organ from fourth parapodium, ×1,200.

Fig. 20. *Poecilochaetus bifurcatus* sp. nov. —— a, Anterior end, dorsal view, ×12; b, papillae on body, ×90; c, second parapodium, anterior view, ×35; d, spine from second neuropodium, ×215; e, fourth parapodium, anterior view, ×27; f, seventh parapodium, anterior view, ×27; g, 11th parapodium, anterior view, ×27; h, 12th parapodium, posterior view, ×27; i, 13th parapodium, posterior view, ×27; j, 14th parapodium, posterior view, ×27; k, 15th parapodium, posterior view, ×27; l, 16th parapodium, posterior view, ×27.

Those notopodia also have a fascicle of long, hispid setae (Fig. 21 c); there are no membranous setae.

Parapodia 4 to 6 resemble one another in general appearance, and each is provided with slender dorsal and ventral postsetal lobes (Fig. 20 e). The dorsal fascicle has hispid setae and a few membranous setae (Fig. 21 d); the ventral fascicle has only hispid setae. Minute cylindrical tubercles with distal cirri (Fig. 21 e) are dispersed on these postsetal lobes.

Parapodia 7 to 11 have ampullaceous postsetal lobes, each with a thick base and a long distal end, terminating in a knob (Fig. 20 f, g). The noto- and neuropodia each have hispid setae and a few membranous setae. The dorsal and ventral postsetal lobes on the 12th and 13th parapodia are bilobate, slender, and are subequal in length (Figs. 20 h, i, 21 f). The setal fascicles consist of membranous setae and hispid setae (Fig. 21 g).

From the 14th parapodium the dorsal postsetal lobe is replaced by a slender, simple lobe (Fig. 20 j), but the ventral postsetal lobe is bilobed, continuing through to the 15th parapodium (Fig. 20 k). From the 16th parapodium, all of the postsetal lobes are like those anterior to setiger 7 (Fig. 20 l). Most setae are slender hispid setae, and a few membranous setae are also present in the fascicle of each podium.

Parapodial sensory organs are present from setiger 1 through fragmental end (Fig. 21 h). No branchiae are seen.

Remarks. *Poecilochaetus bifurcatus* resembles *P. fulgoris* CLAPARÈDE *in* EHLERS, 1875, from the north-east Atlantic and *P. trachyderma* READ, 1986, from New Zealand, in 477–515 m depth in that the body is conspicuously papillated all over, and has modified, ampullaceous postsetal lobes on parapodia 7 to 11. However, *P. bifurcatus* is distinguishable from *P. fulgoris* and *P. trachyderma* in having characteristic bilobed, postsetal lobes in both noto- and neuropodia or only neuropodia on parapodia 12 to 15, instead of short and thick single postsetal lobes.

Poecilochaetus modestus RULLIER, 1965, from Togo and *P. vietnamita* GALLARDO, 1967, from South Viet Nam have also ampullaceous postsetal lobes on parapodia 7 through 11, but they are not papillated all over.

Type series. Holotype, NSMT–Pol. H 272; 1 paratype, NSMT–Pol. P 273.

Distribution. Izu-Oshima, central Japan.

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